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VULCANISATION EXPERIMENTS ON PLANTATION RUBBER.

The Extent of Variability caused by lack of Uniformity in Factory Methods. I.

By B. J. Eaton and J. Grantham.

The experiments to be described in this paper are some of the first which were made with the vulcanising plant at the Department of Agriculture in the course of the search for the factor or factors responsible for variability of plantation rubber. The differences found between the different rubbers in these experiments were small and though some of the results were constant over periods of a week or more the differences were insufficient to be of any great significance.

In view of the theory given in the paper published in the last number of the *Agricultural Bulletin* it becomes possible however to give an explanation of the differences obtained.

Experiment I.

This experiment was one made in order to determine the effect of crepeing on rubber. Every day 5 pieces of rubber were prepared which had been creped as follows:—

A	was creped	5	times.
B	„ „	10	„
C	„ „	15	„
D	„ „	20	„
E	„ „	25	„

This experiment was continued for a period of 7 days. The results for two days are given below.

TABLE I.

SERIES I.

Time of cure. hrs. min.	A			B			C			D			E		
	Breaking load. kgs. per sq. mm. (a)	Extension at break orig. length =100 (b)	Product a x b	Breaking load kgs. per sq. mm. (a)	Extension at break orig. length 100 (b)	Product a x b	Breaking load kgs. per sq. mm. (a)	Extension at break orig. length =100 (b)	Product a x b	Breaking load kgs. per sq. mm. (a)	Extension at break orig. length =100 (b)	Product a x b	Breaking load kgs. per sq. mm. (a)	Extension at break orig. length =100 (b)	Product a x b
1.20	.4	1145	458	.44	1169	467	.45	1168	467	.4	1150	460	.3	1148	344
2.00	.9	1127	1010	.8	1120	888	.8	1083	868	.8	1110	888	.6	1083	649
2.30	.85	984	787	1.03	1031	1031	1.1	1020	1122	.75	973	681	.95	1023	920
2.45	1.25	976	1171	1.0	956	956	1.15	966	1062	1.35	1002	1302	1.25	1005	1256
3.00	1.45	980	1411	1.1	966	1056	1.4	964	1335	1.15	957	1052	1.25	992	1190
3.15	1.25	910	1092							.25	571	114	1.0	887	887
					Series III										
1.20	.35	1100	330	.35	1112	333	.4	1116	446	.3	1047	314	.4	1099	439
2.00	1.15	1089	1197	1.05	1082	1082	1.0	1069	1069	1.0	1056	1056	1.05	1080	1080
2.30	1.3	1034	1344	1.25	1019	1222	1.3	1037	1348	1.3	1037	1348	1.2	1027	1232
2.45	(Sample exhausted)			1.1	935	1028	1.4	1002	1402	1.4	1001	1401	1.5	1016	1524
3.00	.14	950	1330	.3	635	190	1.45	961	1345	1.15	917	1008	1.45	955	1337

The other five days' rubber gave similar results.

It will be seen that these results give no indication of any differences between the rubbers due to the amount of crepeing which they had undergone.

The maximum mechanical properties show no relation whatever to the amount of crepeing. In series I, A gives the best result, in Series B, it is given by E. Nor is any relation apparent between the optimum time of cure and the amount of crepeing. In series I, D and E have a lower optimum cure than A, B and C. In series III, A and B have a lower optimum cure than C, D and E. The differences obtained in both series are evidently due to experimental error, and it is evident that the additional crepeing received by samples B, C, D, E has been without effect on the rubber.

Crepeing between the limits of this experiment is then without deleterious effect. One noticeable feature is that taking each series as a whole, Series 3 has a slightly lower optimum time of cure than Series I, indicating some varying factor in the two days' rubber.

This experiment was made before sufficient accuracy had been attained in the thickness of the test rings, to enable the load—stretch curves to be compared.

Experiment II.

It was thought that although the differences in crepeing in Experiment I were insufficient to produce any effect, a more severe treatment of the rubber would produce deterioration. Consequently two samples of crepe were made one of which (C) was treated in the normal manner, while the other (D) was severely macerated (not merely rolled) on the crepeing machine. This experiment was continued for 8 days and on each day the results were similar. Those for the first 2 days are given below.

TABLE II.

27 Series 1.

	C.			D.		
Time of cure.	Breaking load kgs. per sq. mm. (a)	Extension at break . orig. length- 100 (b)	Product a x b.	Breaking load kgs. per sq. mm. (a)	Extension at break orig. length- 100 (b)	Product. a x b.
1.30	.89	1110	987	.74	1150	851
1.45	.97	1087	1054	.79	1110	876
2.00	1.21	1047	1266	.97	1070	1038

Time of cure.	C. Breaking load kgs. per sq. mm. (a)	C. Extension at break orig. length-100. (b)	C. Product a x b.	D. Breaking load kgs. per sq. mm. (a)	D. Extension at break orig. length-100. (b)	D. Product a x b.
2.15	1. 4	1046	1464	1.05	1055	1110
2.30	1. 2	996	1394	1.16	1044	1384
2.45	1.48	972	1438	1.45	1025	1486
3.00	1.48	937	1386	1.32	951	1168

27 Series 2.

	C.			D.		
1.30	.78	1115	869	.66	1170	772
1.45	.92	1101	1012	.54	1080	583
2.00	1.26	1069	1346	.84	1082	908
2.15	1.26	1056	1328	.93	1067	992
2.30	1.45	1025	1486	1.17	1057	1236
2.45	1.52	1005	1527	1.36	1045	1421
3.00	1.40	944	1323	1.33	992	1320

An examination of these figures reveals no effect, as regards the optimum mechanical results. In series I, D gives the greater maximum while in series 2 it is given by C.

The optimum time of cure is less for C than for D in Series I, and although in Series 2 the same optimum time is indicated it will be seen that the load given by D is less than that given by C, although the extension is greater; this indicates that D is cured to a less extent than C. This effect is however much more evident when the load-stretch curves are examined, D at any given time of cure invariably giving a more upright curve than 3, indicating that it cures more slowly. This effect was constant through the remaining 6 days' rubber.

The effect of the very severe treatment which has been accorded to D (far more than would be necessary in ordinary factory practice) is then merely to slow to a slight extent the rate of cure.

Experiment III.

Sufficient of the rubber prepared in Experiment I remained to enable a fresh set of mixings to be made. This was done with the first day's rubber and this time the curves were compared. A, B, C , D were practically identical but E gave a curve which was slightly more upright indicating a slower curing rubber. This difference will be seen in the numerical results given below, the results of E, at a given time of cure, show a similarity to those of A, B, C, D at a cure of ¼ hour less.

TABLE III.

21 SERIES I

Time of cure. hrs.	A			B			C			D			E		
	Breaking load kgs. per sq. mm. (a)	Extension at break. (b)	Product a x b	Breaking load kgs. per sq. mm. (a)	Extension at break. (b)	Product a x b	Breaking load kgs. per sq. mm. (a)	Extension at break. (b)	Product a x b	Breaking load kgs. per sq. mm. (a)	Extension at break. (b)	Product a x b	Breaking load kgs. per sq. mm. (a)	Extension at break. (b)	Product a x b
$2\frac{1}{4}$	.75	1092	819	.76	1101	836	.74	1079	798	.78	1103	860	.52	1061	551
$2\frac{1}{3}$	.76	1070	813	.79	1077	850	.84	1067	896	83	1079	893	.17	1109	763
$2\frac{3}{4}$	1.05	1028	1079	.96	1015	974	1.04	1010	1050	1.03	1024	1054	.85	1037	912
3	1.18	986	1163	1.21	1000	1210	1.20	984	1180	1.16	986	1143	1.03	999	1028

It will be seen that the product of the load and extension is still rising at 3 hours, but there can be little or no increase beyond this time since the extension is already becoming low.

The mechanical results are low compared with those obtained in Experiment I. Probably this is due to the length of time, 7 or 8 months, which had elapsed between the two experiments. Possibly the age of the rubber is also responsible for revealing the slightly slower rate of cure of E as compared with A, B, C, and D which was not evident in the new rubber.

Experiment IV.

This experiment was made in order to ascertain the effect of adding an excess of acid when coagulating the latex.

Two samples were prepared from bulked latex.

A. Coagulated by 3 ozs. of 5% acetic acid per gallon of latex.

B. Coagulated by 15 ozs. of 5% acetic acid per gallon of latex.

The subsequent manipulation was kept as constant as possible. This experiment was repeated on 6 successive days. In every case the load-stretch curves obtained indicated that B cured more slowly than A, but the difference was not great. The numerical results for 2 days are given below.

TABLE IV.

35 Series 1.

Time of cure.	A. Breaking load kgs. per sq. mm. (a)	A. Extension at break orig. length-100 (b)	A. Product a x b.	B. Breaking load kgs. per sq. mm. (a)	B. Extension at break orig. length-100 (b)	B. Product. a x b.
1.45	.97	1051	1019	.87	1080	939
2.00	1,12	1020	1142	.98	1040	1019
2.15	1.16	981	1089	1.08	1010	1090
2.30	1.31	955	1251	1.21	980	1185
2.45	.35	664	232	1.44	961	1382

35 Series 3.

	A.			B.		
1.45	1.00	1056	1056	.77	1091	840
2.00	1.05	1010	1060	.92	1665	979
2.15	1.26	995	1253	.98	1024	1003
2.30	1.39	940	1306	1.14	994	1133
2.45	1.32	902	1190	1.41	992	1398

It will be seen that A gives its optimum mechanical results at $2\frac{1}{2}$ hours cure and B at $2\frac{3}{4}$ hours in both series given above.

The difference in rate of cure is also evident when figures other than those at the optimum time of cure are considered. *e.g.* A in Series I shows the collapse due to overcure at $2\frac{3}{4}$ hours. The differences in mechanical properties between A and B are small and not outside the range of experimental error.

Experiment V.

This experiment was made in order to find the effect of adding sodium bisulphite to the latex to prepare pale rubber.

Two samples were prepared from bulked latex.

A. 3 ozs. of 5% acetic acid per gallon of latex only.

B. 3 ozs. of 5% acetic acid + 2 ozs. of 5% sodium bisulphite per gallon of latex.

The subsequent treatment was kept as constant as possible. This experiment was also repeated on six days. The results indicated by the load-stretch curves were not constant. On four days they indicated that B had a slightly slower rate of cure than A. On the remaining two days the reverse effect was shown. The difference in every case was extremely small and probably due to experimental error.

The numerical results for two days are given below.

36 Series 1.

Time of cure.	A. Breaking load kgs. per sq. mm. (a)	A. Extension at break / orig. length-100 (b)	A. Product a x b	B. Breaking load kgs. per sq. mm. (a)	B. Extension at break / orig. length-100 (b)	B. Product a x b.
1.15	.62	1150	713	.52	1130	587
1.45	.67	1025	686	.66	1042	687
2.00	1.03	1027	1057	.98	1039	1018
2.15	1.16	1019	1182	1.07	1023	1094
2.30	1.20	964	1156	1.35	996	1344
2.45	1.33	944	1255	1.42	967	1373

Series 4.

	A.			B.		
1.15	.4	1037	415	.53	1132	600
1.45	.96	1080	1036	.83	1080	896
2.00	1.06	1045	1107	.94	1049	986
2.15	1.24	1004	1245	1.15	1002	1152
2.30	1.41	968	1365	1.23	980	1205
2.45	1.34	929	1211	1.35	950	1282

Series I shows a close resemblance in mechanical properties and rate of cure between A and B. The difference shown in the load-stretch curves is so slight as to be imperceptible in the figures.

Series 4 again shows a general resemblance between the mechanical properties between A and B. A study of the figures at all times of cure shows that the difference in the optimum time of cure of ¼ hour is probably accidental. The difference shown by the curve is much less than that corresponding to ¼ hour.

SUMMARY.

(1). The effect of crepeing on rubber both as regards optimum mechanical properties and rate of cure, is negligible unless excessive. The slight effect in retarding the rate of cure in excessively worked rubbers is, in view of the theory given in our previous paper (*Agricultural Bulletin*, Feb. 1915), probably due to removal of traces of a catalytic substance or something necessary to its formation, *i.e.* to overwashing rather than overworking.

(2). The effect of using excess of acetic acid for coagulation of the latex has a well marked effect in retarding the rate of cure. Here again the acid probably has the effect of reducing the amount of the catalytic substance finally present in the dry rubber. The mechanical properties are not affected.

(3). The effect of bisulphite on *crepe* rubbers is nil. (There is reason to believe that the use of bisulphite in the preparation of sheet rubbers and other forms in which the bisulphite is not afterwards completely removed, is injurious.)

We hope to be able to publish very shortly a second paper giving the extent of the variability due to variations in the time of smoking, the thickness of the prepared rubber, and the concentration of the latex.

A NOTE ON SULPHUR-ARSENIC MIXTURES FOR FUMIGATING TERMES GESTROI.

BY P. B. RICHARDS.

Recent experience of white ant control work on rubber estates indicates that the method of treating with Sulphur-arsenic fumes has fallen into disfavour with many Managers. The white ant machines are consigned to the lumber room, and the method is supplanted by treatment of the soil with solutions of various natures, by digging in lime or other chemicals at the roots, or by clearing the soil away from the roots and collar and painting the

bark so exposed with one or other patent preparation. It may be that among these methods there is one which is superior to fumigating, but the writer has yet to see a case which supports this conclusion. In no case within his experience where the sulphur-arsenic fumigating method is applied thoroughly, using an effective mixture of sulphur and arsenic, have the results been unsatisfactory. For example, the Manager of one of the best known estates in Malaya stated recently that not more than 20% of the trees fumigated on that estate ever require re-treatment. On the contrary another estate recently inspected, upon which a different method was employed, showed re-attacks within a few months on the majority of treated trees.

It is intended to deal in some detail with the question of white ant treatment in the series of monthly papers now running in the *Agricultural Bulletin* upon the control of insect pests. It is thought, however, that a short note should be published now upon one matter which is of vital importance to the success of sulphur-arsenic fumigation.

The main reasons for the lack of success with the fumigator upon some estates are as follows:—

(i) The smoking gang are not trained in the proper use of the apparatus.

(ii) The apparatus is not kept in good working order.

(iii) The most intelligent coolies available should be selected for the work, but usually are not.

(iv) The work is not organised carefully or sufficiently supervised.

(v) The mixture of sulphur and arsenic is not in right proportion.

The first four reasons for failure can be disposed of by the management, but however well trained the gangs or efficient the organisation, the white ants will not be seriously affected while the last reason remains. This is outside the scope of the average Manager, and is the reason to which may be ascribed the majority of failures.

Upon the declaration of war with Germany, a proprietary powder sold for use with the Universal White-ant Exterminator became no longer obtainable. To meet the demand for fumigating powder, various mixtures of arsenious oxide and sulphur were made and sold. Some of these were good, comparable with the "Universal

powder." Others were very bad. In various samples analysed by the Agricultural Chemist, proportions of sulphur to arsenic varying between 75 parts sulphur to 25 parts arsenic and 15 parts sulphur to 85 parts arsenic were determined. The sulphur was in different degrees of fineness, very roughly crushed block sulphur being sometimes used. The intimacy of the mixture of arsenic and sulphur also varied considerably.

The underlying principle of the "Universal" Exterminator is that when sulphur and white arsenic are heated together strongly in the proportion of one part by weight of sulphur to seven of white arsenic, arsenious sulphide is formed in a condition of vapour, condensing to a lemon-yellow highly poisonous powder. The arsenious sulphide is prepared by placing a quantity of the sulphur-arsenic mixture on to a charcoal fire in a retort, the heat being maintained under a forced draught from a pump which serves also to drive the fumes out of the retort through a nozzle. The nozzle is inserted into the white ant nest, underground runway, or attacked tree, and the fumes forced in by pumping for five to fifteen minutes. In short, the method is simply the manufacture of orpiment (arsenious sulphide $As_2 S_3$) on a small scale, distributing it in the vaporised condition through the termitarium.

The formula which may be taken to represent the reaction is as follows:—

$$2\ As_2O_3 + 3\ S_2 = 2\ As_2S_3 + 3\ O_2$$

Arsenious oxide Sulphur Arsenious sulphide.

According to the atomic weights, 396 parts by weight of arsenious oxide combine with 192 parts of sulphur to form the arsenious sulphide; in round numbers two to one. In order to obtain the reaction, however, it is necessary to use seven parts of arsenious oxide to one part sulphur. If less white arsenic is used, arsenic sulphide, ($As_2 S_5$) probably forms, or the white arsenic may be volatilised as such, the sulphur burning to sulphur dioxide or distilling over and condensing in the nozzle.

It follows from the above reaction that a considerable quantity of white arsenic is volatilised and driven out of the nozzle along with the orpiment. In addition there may be some sulphur dioxide, especially if the retort does not contain sufficient red hot charcoal, possibly a little carbon bisulphide and realgar, ($As_2 S_2$) and, of course, carbon monoxide and carbon dioxide formed from the charcoal and air. All of these have an asphyxiating effect upon the

termites which they overtake in the runways or nest. If it were possible to reach and exterminate by asphyxiation all the termites in the colony, the suffocating gases alone would serve one's purpose, and there would be no need to use arsenic. This is, however, impossible to accomplish in most cases, owing to the ramifications of the runways and their often great length. The arsenic fulfils two important functions. The major of these is to poison those individuals which escape suffocation. The orpiment and white arsenic condense along the runways or in the nest, at greater or less distance from the fumigator according to the successfulness of the operation, covering the fungus gardens from which the young are fed, the bodies of the suffocated insects, and the walls of nest and tunnels with a layer of deadly poison.

Termites generally being frugal animals, they eat the bodies of their dead. By eating the poisoned individuals, dying, and in turn being eaten by others, the poison is dispersed among a great number of the termites which escaped suffocation. If the poison fumes penetrate to the nest, not only the young hatched prior to the application are killed, but those also which subsequently emerge from the egg find a poisoned food supply, while the deposit upon the runways or inside the treated tree serves as a strong protection against reattack of that tree even if the nest be not affected.

The other function of the arsenic is to show by the escape of visible fumes where any leakage is taking place. This is important because it is necessary to maintain as high a pressure as possible in the runways in order to force the fumes along them. Any reduction in pressure means a corresponding reduction in the efficiency of the operation.

It is possible that realgar (As_2 S_2) or arsenic sulphide (As_2 $S)_6$ may be equally as good as orpiment for white ant treatment. It also seems probable that the use of orpiment as such would be effective, thus saving the excess of arsenious oxide. So far as the writer knows, there has been no extensive work carried out on the subject, nor is there any literature available. It will be well, therefore, to continue for the time with the orpiment method, using the mixture of arsenious oxide and sulphur which gives the best result with that method. This should consist of 87.5% by weight of Arsenious oxide (As_2 O_3) and 12.5% of sulphur. The sulphur should be in the form of flowers of sulphur or very fine ground sulphur such as is sold for dusting plants. The mixture should be as intimate as possible.

It must be emphasised that the recipe given above should not be regarded as the last word on white ant powder. It is the mixture which appears to give the best results in the field, but experiment may show that it can be modified with advantage, or may even result in it's being superseded by an absolutely different substance.

A DISEASE OF MANGOSTEEN TREES.

By W. N. C. Belgrave.

Mangosteen trees (*Garcinia Mangostana*) in this country are liable to attack by the fungus *Zignoella Garciniae* (P. Hennings) which causes the formation of cankers in their stems, starting from the younger and working back to the older branches. When the cankers have developed so far as to "ring" the branches, the foliage withers, turns brown, and dies; this is rapidly followed by the death of the whole tree.

In cross-section the cankers are seen to extend inwards to the wood, but only rarely is the latter attacked. Two or three cork layers are usually visible in the affected bark, representing so many attempts on the part of the plant to resist the fungus attack; under the innermost of these, is a soft area devoid of yellow latex—the cork-producing cambium.

Hyaline hyphae are abundant in the affected bark, and there also the fructifications are produced; minute perithecia containing numerous very fine paraphyses and long cylindrical asci. These bear eight, 3-5 septate small, colourless, cylindrical ascospores, arranged in two rows.

Fructifications of another fungus, a species of *Hendersonia*, are often found on cankers. They are pycnidia containing dark-coloured 3-4 septate spores. It is probable that this is another stage of *Zignoella*.

Watt in "The Commercial Products of India" (p. 553) mentions the mangosteen as liable to attack by "gamboge canker," but Ridley—Bull. S. S. and F. M. S. (i p. 373) includes no fungi in his list of pests.

It is unlikely, failing special inspection which would certainly not be repaid, that the cankers would be noticed before the withering of the leaves, when the death of the tree is assured. When the fungus appears, the most practical measure would be to cut out and burn all dying trees, and to examine the others in the vicinity, cutting off any cankered branches.

VULCANISATION AND TESTING OF RUBBER. NOTES AND CRITICISMS.

By B. J. Eaton.

The following notes do not pretend to any sequence or orderly arrangement, being merely ideas and criticisms which have suggested themselves to the writer, in connection with work on vulcanisation and the published work of others, especially a recent paper by Fol of the Netherlands Testing Station,Delft, Holland.

The absence of any central organisation for the co-ordination of rubber research, especially vulcanisation researches and mechanical testing of rubber, or perhaps it would be more accurate to say the failure of the existing (possibly now defunct) International Rubber Testing Committee to carry out the work for which it was obviously constituted, is to be deplored. Such an organisation might have done excellent work in directing research along definite channels and have prevented what, in the writer's opinion, must be considered, to a great extent, useless or wasteful work.

Perhaps however the chief fault lies in the fact that, till within the last two years, such work was in the hands of private consulting chemists or rubber technologists, who naturally had their own axes to grind and could neither be expected to give their methods, be they good or bad, to the public at large. The same remarks apply to the probably very valuable researches which must have been carried out by chemists attached to different rubber works, whose work could obviously be available only for their particular firms.

Planters and producers often forget that the big manufacturer or consumer, by possessing a scientific testing laboratory, is enabled to purchase plantation rubber at favourable prices compared with the smaller consumer, and he is naturally not going to inform the producer where the trouble lies, when he knows how the variation and differences in his product can be corrected, since such information would become available for his smaller rival.

The small manufacturer or consumer, on the other hand, is unable to say where the cause of the trouble lies, because he does not know. Hence the dilemma of the producer. To complicate the problem still further, we have the broker, who acts as a middleman between producer and consumer, and whose "methods" of valuation of rubber are useless, as far as real value of the raw rubber is concerned.

During the last two years however several official or semi-official experimental rubber testing stations have been established in various parts of the world, but it is somewhat early yet to expect results from the work being carried out in these institutions. From the results of recent experiments carried out by the writer and Mr. Grantham at the testing station of the Agricultural Department, Federated Malay States, it has become obvious to us that those in charge of such work in countries, other than the country of origin of the rubber to be tested, will find the problem very complex, and the results obtained very anomalous and apparently contradictory, unless the smallest details of manufacture of the raw rubber are known, that is the complete life history of the rubber from the tree to the factory and subsequently.

For a considerable time the results of tests on experimental samples prepared at the Agricultural Department factory were or appeared to be unexplainable, till the discovery reported in the previous number of the *Agricultural Bulletin* was made.

One had been led to believe that variability in plantation rubber was almost, if not entirely, a problem of mechanical properties and, judging from many results of vulcanisation tests previously published, that rubber from a particular genus, such as *Hevea*, cured always in the same way, the only differences being in the mechanical properties of the vulcanised material such as breaking load, elongation at break, resistance to stretching, recovery, hysteresis, etc.

Our experiments have shewn that considerable differences may occur if the methods of coagulation and preparation are not constant. Whether natural differences in latices from different estates, caeteris paribus, cause marked variability remains to be investigated. It appears more probable however that the differences can be attributed almost entirely to artificial factors.

Apropos of these remarks, especially as to the necessity of conducting vulcanisation research on satisfactory lines, I propose principally in this paper to criticize some results recently obtained by Fol of the Netherlands Rubber Testing Station, Delft, Holland, published in a paper presented to the International Rubber Congress held in Batavia in 1914. (This paper is contained in the Report of the Congress.) Fol in this paper gives the results of tests carried out on 137 samples of plantation Para rubber collected from various markets in Holland, Belgium and England. The whole forms a

very interesting series of results, but unfortunately no account is taken of the variable vulcanising capacity of plantation rubber and hence the results lose their real value, since, although variations are undoubtedly shewn, these have no significance beyond the fact that in some cases the figures, for example, of breaking load may be too low and the elongation at break high because the sample is "undercured" and therefore soft or the sample gives a low breaking load and low elongation at break on account of the fact that the sample had been "overcured" and is brittle. Fol in obtaining these results has vulcanised all the samples with 7.5 per cent of sulphur at a steam pressure of 3½ atmospheres for 1½ hours.

By keeping all the above factors constant he has necessarily made the assumption that all the rubbers cure in a similar manner, which, as our experiments have shewn, and Schidrowitz has previously shewn, without however being able to assign the variation in rate of cure to any particular cause, is far from the truth and renders the method of experiment valueless for comparative purposes. Fol appears to admit that the method was incorrect but excuses it on the ground of expediency, which cannot be considered a reasonable excuse for scientific research where the method must be, as far as possible, sans reproche.

Now it is known that (1) the combination of rubber and sulphur in the presence of heat follows what is known in scientific language as the "Law of Mass action" *i.e.* the greater the proportion of sulphur added to the rubber, within certain limits, the greater will be the proportion combined with the rubber under definite conditions, (2) the higher the temperature of vulcanisation the more rapid the combination of rubber and sulphur becomes, (3) the longer the period of vulcanisation the greater the amount of combined sulphur. To this may be added (4) the greater the proportion of some particular catalyst derived from the latex and present in the raw rubber, the more rapid the combination of rubber and sulphur.

With reference to the first three factors, which can be controlled by the manufacturer, the simplest and most convenient variant is that of time and we have therefore adopted this method of procedure in our experiments *i.e.* the amount of sulphur mixed with the rubber and the temperature of vulcanisation have been kept constant while each sample of rubber has been put through different periods of vulcanisation. (N.B. By raising the temperature we may cause overheating as well as over vulcanisation of the rubber.)

In this way we have found what has already been ascertained by Dr. Schidrowitz, in the case of plantation Para rubber, and by Weber and others, on different lines, in the case of rubbers from trees of different genera and species, namely, that the rate of cure varies considerably, and we have discovered, in addition, the cause of this variation in rate of cure.

The earlier workers on the problem appear to have drawn their conclusions from the proportion of combined sulphur in different rubbers cured for different periods, whereas Schidrowitz has based his published results on the mechanical properties of the vulcanised rubbers.

Although we have not had sufficient time yet to carry out analyses to ascertain the amount of combined sulphur in our samples, it is obvious that there is some relationship between the amount of combined sulphur and the mechanical properties for a particular cure. Whether it will be found that the amount of combined sulphur at the correct rate of cure is more or less a constant, like the mechanical properties, remains to be investigated and we propose to ascertain this shortly.

Returning once more to Fol's samples, we can say, almost with certainty, that samples Nos. 5, 6, 7, 8, 10, 21, 41, 42, 54, 55, 59, 60, 66, 70, 75, 80, 114, 116, 123 and 128 are undercured and samples 23, 28, 44, 45 are overcured. All the undercured samples show a low breaking load and a low vulcanisation coefficient *i.e.* a low percentage of combined sulphur, while the overcured samples show a low extension and a high vulcanisation coefficient.

Fol remarks further that sample No. 66 was judged by the sender as the best sample of his batch whereas the sample was judged as the worst by the Experiment Station.

In this case the experiment station is probably quite incorrect in judging this sample as the worst, except from the point of view that the figures show it to be a very slow curing rubber. Sample No. 70 would appear to cure at about the same rate, judging both from the figures of elongation and load at break and the vulcanisation coefficient. The sender is therefore also wrong in classifying No. 66 first in order of merit and No. 70 as fifth since they are both probably equal in quality. The sender's classification is evidently based on the fact that No. 66 was blanket crepe and therefore tougher (sic) than the thinner crepe.—a question of thickness entirely.

By a careful perusal of all the figures it would be possible to classify these samples in the order of their rate of cure, but since this would require considerable time and labour I do not propose to do it here.

Another point to which attention must be directed, as we have shown in a full discussion on our previous experiments elsewhere, is the unsatisfactory character of the breaking point figures, as absolute figures of quality, whereas the curves of elongation and load are very constant.

Perhaps the most satisfactory figures given by Fol from the point of view of their value to a critic are the figures for "permanent deformation" at a 400 per cent extension during 24 hours stretching.

As will be readily seen, when the breaking point is high, and the elongation at breaking point is also good, the permanent deformation is low and vice versa. These figures for "permanent deformation" represent, better than any others, the state of cure of the samples. Undercured samples are very soft and, on prolonged stretching to any extent, a large permanent deformation takes place, that is, the power of recovery after stretching is very poor, whereas, if properly cured, the power of recovery varies very little. (Note:—Sample 28 which is much overcured evidently broke under a prolonged stretch of 400 per cent obviously due to being brittle). Samples 2, 3, 17, 25, 26, 43, 46, 47, 48, 49, 53, 58, 62, 71, (72?) 74, 76, 77, 78, 79, 82, 83, 87, 88, 89, 92, 93, 94, 95, 97, 100, 101, 102, (104?) 106, 107, 108, 109, 110, 111, 112, 118, 121, (122?) 124, 127, 133, and 134 are all either cured correctly or very nearly so because they happen accidentally to have their optimum cure under the conditions chosen.

The classification adopted by Fol (Table IV) is probably justified, as far as the condition of experiments adopted by him are concerned. If however he had taken the optimum time of cure for each sample, he would have found that most of his samples would have fallen into either Class I or II on the basis adopted, and the order of merit would have to be decided largely on the period of cure required, *i.e.* a rapidly curing rubber (caeteris paribus) being classified higher than a slow curing rubber.

It is quite true that the samples may be said to exhibit great variability in mechanical properties on the published figures, but those differences represent, in the figures published, only a degree of under or overcuring and the figures by no means give a fair com-

parison between the rubbers, since they depend on a comparison with a rubber which cures correctly under the condition employed *i.e.* 1½ hours under a steam pressure of 3½ atmospheres, a purely arbitrary standard, whereas had some other steam pressure or time been adopted, many of the results would have been reversed, and a different order of merit would have been obtained.

What we have to ascertain is the condition—period of cure—at which the optimum results are obtained for each rubber. Other things being equal, the order of merit would then depend on the rate of cure, since rapidity of cure means economy to the manufacturer.

Now there is no apparent reason for such an arbitrary standard being adopted. If we knew, for example, that Fine Hard Para gave its optimum mechanical properties at this particular period of cure under the other conditions employed, and that all samples of Fine Hard Para were more or less constant at this period of cure, we should be justified to a certain extent, in employing it as an arbitrary standard, from the fact that Fine Hard Para is the market standard. Even this however does not absolutely justify the adoption of such conditions of cure, since Fine Hard Para may not be the highest and best form of rubber, although manufacturers, on account of their long experience of its uniform behaviour on vulcanisation, would prefer it to other untried brands.

Although scientific research has been of such great value to manufacturers of all kinds, some manufacturers are still inclined to belittle the results of experiments on a small scale and certainly, in many cases, with justification, so that we cannot expect them to adopt our suggestions or agree with our conclusions immediately, and hitherto scientific research cannot perhaps be said to have rendered much assistance to the rubber industry. It is obvious however that if we can discover a type of rubber which vulcanises more rapidly than Fine Hard Para and has otherwise similar properties, such a rubber should be worth considerably more to the manufacturer, provided we can attain uniformity in the rate of cure also.

The former we claim to have discovered, viz. the preparation of rubber in a slab form, in which it retains most of the serum constituents necessary for vulcanisation, and unaffected by smoking, which retards the rate of cure.

Two other methods giving similar results, have also been discovered (*a*) smoke coagulation of latex in thin layers, in which the

smoking only affects the surface (*b*) dessication of thin layers of latex in drying chambers which also has the same effect.

It is possible that another application of this latter method may prove of value on a commercial scale viz. the centrifugalization or spraying of latex in heated chambers, in which small particles of latex are thrown on to a heated drum or revolving disc, and become dessicated by the action of the heat on the small particles. If oxidation occurs by carrying out such a process under ordinary conditions, inert gases, such as carbon dioxide could be used in the chambers employed.

The attainment of uniformity by method (*a*) smoke coagulation of latex over a period of days or weeks, is probable, on account of the fact that daily variations are averaged. The attainment of uniformity in method (*b*) dessication of latex, is also probable.

It would probably be difficult to attain uniformity in respect to vulcanising capacity in slab rubber coagulated by means of acids, etc., since the slabs would have to be very carefully prepared under standard conditions. It may be however, that we shall discover some other method of fixing the catalytic accelerating agent, without destroying its effect at the same time.

In a perusal of the discussion on the preparation of rubber at the same congress Dr. Vriens mentions that the Dutch American Plantation Company, which has its own vulcanising factories in America, sends home all its rubber in the form of slab, resembling sides of bacon, the rubber being subjected only to pressure, to squeeze out as much moisture as possible. This is interesting in view of our results on the rapidity of cure of slab rubber which has possibly been realized by this company even if the cause was unknown.

Note:—Since the vulcanisation experiments published by Mr. Grantham and the writer in the previous issue went to press, the official report containing the paper read at the International Rubber Congress, London 1914 has been received. An interesting paper by Dr. Schidrowitz on variation in plantation Para rubber is contained in this publication, and although considerable variability is indicated in respect to rate of cure, this variability has not been attributed to any definite cause, as indeed would have been difficult, to a worker in Dr. Schidrowitz's position.

METHODS AND MATERIALS FOR THE CONTROL OF INSECT PESTS.

PART 4.

By P. B. Richards.

CHEMICAL MEASURES. STOMACH POISONS (*Contd.*)

Carbon Compounds.

The remaining carbon compounds in general use as stomach poisons are nicotine, quassia, and hellebore. Of these nicotine is the most important.

Nicotine. Tobacco Extract.

Preparation.

Nicotine is an alkaloid contained in the stems and leaves of plants of the genus Nicotiana. When pure it is a colourless oily liquid, but on exposure to air it turns yellow and resinous. It is one of the most violent known poisons.

Nicotine is an important ingredient in many patent insecticides. It is obtainable also in the form of tobacco extract, which is prepared on a large scale by treating coarse tobacco leaves and waste with hot water and distilling the solution obtained.

In France the preparation of tobacco extract is an important part of the tobacco monopoly. Extracts of standard strengths, usually 10% nicotine, are sold under guarantee of the Administration of Agriculture at a fixed price. The extract is largely used in combating vine pests.

In America several well known commercial preparations of tobacco juice are on the market. "Blackleaf 40" is an extract containing 40% of Nicotine sulphate. Another extract of similar strength is "Nico-fume" which contains 40% of free nicotine. Others, such as "Blackleaf Extract" contain from 2% to 3% nicotine. Such nicotine sprays have been increasing in favour in America during the past few years in spite of the fact that the preparations are expensive. Thus, "Blackleaf 40" costs £1-6-0 per lb., and "Blackleaf Extract" of 2.7% strength costs 6/3 a gallon. "Blackleaf 40" is used in dilutions containing from 0.02 to 0.04% of nicotine at which strengths the spray fluid costs from six to twelve cents a gallon. "Blackleaf Extract" is diluted with 100 to 150 volumes of water and the cost and strength are about the same.

There is no doubt as to the value of nicotine as a spray for small insects and for mites, but at such prices the wash is too expensive for use on any but valuable crops. There seems no reason, however, why by growing a coarse tobacco with a high nicotine content, and making the wash themselves, cultivators in this country could not obtain a very effective spray fluid at such a cost as would compete favourably with the majority of available insecticides.

Green tobacco leaf usually contains 1.5% to 2% of nicotine. The stems and ribs have a smaller nicotine content. The heaviest crop and the highest percentage of nicotine is obtained from rank, coarse-growing varieties cultivated so as to increase the strength of growth as much as possible. For this purpose *Nicotiana rustica* would probably be satisfactory, and if well grown in this climate a nicotine content of 4 or 5% in the dried leaf should be obtained. Though the nicotine content depends to a considerable extent upon the conditions of growth, the tendency to produce a high or low percentage of nicotine appears to be an inherited quality of the plant. The proportion of nicotine is no indication of the quality of the tobacco, but on the other hand most smoking tobacco is so grown that the nicotine content is low. For the purpose of growing tobacco for making nicotine wash, therefore, it would be well to secure seed from a stock of which the nicotine percentage is known to be high.

To make the wash, the leaves should be broken up as finely as possible and extracted in three successive lots of water at the rate of one gallon of water to each pound of leaves. The tobacco should be steeped for twenty four hours in each lot of water. The operation is facilitated if the water is warmed, but the temperature should not exceed 140° Fahr., or some of the nicotine will be lost by volatilisation.

On no account should the solution be boiled unless it is desired to distil the nicotine to obtain a concentrated extract—an entirely unnecessary operation. After the third steeping the three lots of extract should be mixed together.

To extract the nicotine from the stems and ribs, these are first crushed and are then soaked in water at the rate of five pounds to the gallon, the soaking being repeated with a fresh gallon of water on three successive days, as with the leaves. The nicotine content of the stems being about one fifth of that of the leaves, this gives an extract of approximately the same strength.

Presuming a nicotine content of 4% in the leaf, and 0.8% in the stems, the extract so made would contain 0.13% of nicotine if all the nicotine came into solution. Actually an extract containing about 0.12% would be obtained. For use this would be diluted down to 0.06 or 0.04% by the addition of another three or six gallons of water.

Tobacco extract is rendered more effective by mixing with an emulsion. The simplest for the purpose is soap, which may be added at the rate of two to four pounds to one hundred gallons of wash.

Nicotine extract keeps well if stored in air-tight vessels, but the process of extraction is so easy that there is no object in storing. It is better to make and use the wash as it is required.

It is advisable, if possible, to have the percentage of nicotine in the leaves ascertained experimentally, so that a wash of any required strength may be accurately obtained.

The possibilities of nicotine wash from home grown tobacco in England were pointed out in an article in the *Journal of the Board of Agriculture,* March 1913, as the result of experiments conducted by the South Eastern Agricultural College, Kent. The recipe given above for the preparation of the wash is based on that article.

Properties.

Nicotine is an oily liquid with a caustic taste and strong odour. It is soluble in water. It boils at 250° C, but is notably volatile at ordinary temperatures both from the pure liquid and the aqueous solution, and it distils readily with steam from the aqueous solution at 100° C. The aqueous solution is powerfully alkaline.

Nicotine is a violent stomach poison to animals. Its stomach action is not quite so marked on insects, but it is effective against small caterpillars. The fumes of the nicotine volatilising from the sprayed foliage probably have some narcotising effect. It is however, as a contact poison that its action is most beneficial.

Nicotine must not be used in too great strength on delicate foliage. Hops will stand spraying with 0.08% solution, at which strength rose shoots are injured. The limiting strength of application should be obtained by trial sprayings of individual plants of the crops to be treated.

Use.

Tobacco extracts are employed as sprays against small soft-bodied insects. Their main action is of a contact poison nature,

but their poisoning effect when eaten is sufficiently marked for them to be included under stomach poisons. They are also used in the preparation of fumigants and will be again considered under that head.

Nicotine preparations are of great value against aphids (green fly), coccids (scale insects), thrips, the young nymphs of the smaller plant bugs, the larvae of small moths and against vegetable feeding mites. The strength of solution used is determined by the resistance of the host plant. A strength of 0.025% nicotine usually kills aphids and thrips, and should be harmless to delicate vegetation. If, however, the plant can stand it, a stronger spray fluid should be used, up to 0.1% which will probably be found to be near the limit of economical application. For bug nymphs, and for scale insects having a waxy covering or a hard scale, the addition of from 2 to 4 lbs. of soap per 100 gallons of wash is necessary to ensure efficient wetting.

The application should be made with a fine jet, and the higher the pressure, up to about 100 lbs. per square inch, the more efficient will be the application.

Hellebore root.

Under this name are included the roots of *Veratrum viride* and *V. album*, plants of the Natural order Melanthaceae, and of *Helleborus niger* and *H. foetidus*, belonging to the natural order Ranunculaceae. The two former contain poisonous alkaloids while the latter two owe their poisoning property to glucosides.

Preparation.

To make a spray mixture with any of these, 5 to 7½ lbs. of root are finely pulverised and stirred up with 100 gallons of water. The mixture is strained and is then ready for use. The roots should be fresh ground or if the powder is stored it must be kept in a tightly closed vessel as its value deteriorates rapidly on exposure to the air.

Hellebore root can also be used as a dusting powder, for which purpose it is mixed with three times its weight of neutral powder such as flour, gypsum, or wood ash.

Properties.

Hellebore is poisonous to leaf eating insects. It is also poisonous to man if taken in considerable doses. It is not harmful to plants.

Use.

Hellebore infusion and powder can be used with advantage on ornamental plants where it is not thought desirable to use arsenic, lead, or nicotine sprays. It is often recommended for treating ripening fruit because its poisonous properties disappear after three or four days exposure to the air. This is true only of the roots of *Veratrum album* and *V. viride,* and not of the species of Helleborus. Fruits and vegetables about ready for use should, therefore, not be treated with hellebore root unless it is certain that either the green or white hellebore (Veratrum) and not the black hellebore (Helleborus) is being used.

Quassia.

Quassia contains a bitter principle, quassiin, which is readily obtained by exhausting quassia chips with hot water. It has found its way into many insecticide formulae, but it is doubtful if it does much towards increasing the efficiency of the mixtures. Its action is at present unknown and it may well be left out from the Eastern cultivator's list of insect remedies.

(Contact poisons will be considered in the next number.)

MANGROVE CUTCH IN THE FEDERATED MALAY STATES.

By B. H. F. Barnard,

Acting Conservator of Forests, F. M. S. and S. S.

Attention has from time to time been drawn to the possibilities of establishing a Mangrove Cutch industry in the Federated Malay States. The following notes may be of use to those interested in the subject.

The Mangrove forests on the coasts of the States of Perak and Selangor cover an area of about 250 square miles. This forest varies considerably in its composition, according to the nature of the soil, and to the extent to which it is liable to inundation by the tides. The principal species of trees are *Rhizophora mucronata, Rhizophora conjugata, Avicennia officinalis, Bruguiera gymnorrhiza, Bruguiera caryophylloides, Bruguiera parviflora, Ceriops candolleana, Carapa moluccensis,* and *Sonneratia apetala.* Of these the first seven mentioned are known to contain tannin in varying quantities. The others may also produce it, but the quantity would probably be small and the quality indifferent.

Analyses of the extract from the bark of these trees have been made at various times. The following tables show some of the results arrived at.

Analysis by Acting Government Agricultural Chemist, F. M. S. 1912.

Ceriops candolleana ..	.. 42.6%	tannin
Rhizophora mucronata	.. 29.1%	„
Rhizophora conjugata	.. 10.4%	„

Analysis of the Federated Malay States mangrove barks made by the chemist of the Bureau of Science of the Philippine Islands in 1909.

	Total extract.	Non-tannin.	Tannin.	Moisture.
Bruguiera gymnorrhiza ..	28.3%	4.2%	24.1%	15.9%
Rhizophora mucronata ..	40.7%	5.4%	35.3%	15.2%
Ceriops candolleana ..	37.1%	5.5%	31.6%	13.5%

Analysis of Philippine mangrove barks made in the Laboratories of Plant Industry, Washington, D. C.

	Total Solids	Soluble Solids	Reds	Non-Tannin	Tarnin
Ceriops candolleana	58.58%	49.02%	9.56%	13.19%	35.83%
Rhizophora mucronata	53.91%	51.03%	2.88%	11.64%	39.39%
Bruguiera gymnorrhiza	37.36%	36.81%	.55%	10.15%	26.66%
Bruguiera parviflora	24.43%	19.82%	4.61%	7.27%	12.55%

Further analyses of the Federated Malay States barks are now being made and the results will be published in due course.

Cutch is manufactured in the Federated Malay States and Straits Settlements only in small quantities for local use. The bark that is preferred is that of *Ceriops candolleana*, locally known as Tengah, but this species is not available in large quantities.

A large part of the whole area of the mangrove forest is composed of pure *Avicennia officinalis*. This species is known to contain a small amount of tannin, but no figures are at present available as to the quantity.

The forests are worked on a regular system for firewood, the quality of which is excellent. The most abundant species are *Rhizophora mucronata* and *Rhizophora conjugata*, which between them constitute by far the greater part of the whole stock of the forest.

In the working of the firewood under present conditions the bark is entirely a waste product. Between 6000 and 7000 acres of mangrove forest are leased annually to Chinese firewood cutters. These cutters would be glad of an opportunity to dispose of the bark. The system under which the forest is worked provides for the exploitation of an equal area every year in perpetuity. Mangrove firewood is used by the Federated Malay States Government Railways in their locomotives, in many engines working on the tin mines, and also for domestic purposes. As a fuel it has advantages over coal in that the price is not liable to frequent or violent changes, and that quality is both good and constant. These points are mentioned in order to show that it is unlikely that the forests will cease to be worked for firewood and the cost of bark thereby increased.

The average out-turn of firewood from the forests during the last 3 years was 128,000 tons. In addition to this a large quantity of wood, consisting of branch-wood and crooked and knotted stems are left in the forest, owing to the difficulty in splitting the wood. The bark of this wood would also be available.

Besides the area referred to above as being leased annually, there are other smaller areas which are worked for firewood under licence and from which the supply of bark might be supplemented. Transport in the mangrove forests is exceptionally easy, the whole forest being intersected by creek and water ways, ever the smallest of which is navigable by small boats at high tide.

It was stated some time ago by a writer in the *Financial Times* that the mangrove swamps were so unhealthy as to be likely seriously to affect the labour question. The truth of this is emphatically denied. The wood cutters and fishermen who inhabit the villages in these forests are exceptionally healthy. Malaria is less in evidence than in inland districts.

The quantity of bark that can be obtained from one acre varies considerably with the state of the forest. Experiments are being made in forest of all types with the object of obtaining more reliable information on this point. As far as is at present known one acre will yield from 4 to 8 tons of bark.

The quantity of cutch derived from a given quantity of bark will depend largely upon the process of manufacture.

It has been stated that large sums of money have been lost in attempts to develop the mangrove cutch industry in the East. This

is certainly not true of the Federated Malay States for no attempt has ever been made to establish such an industry here. It is a fact that some enterprises of the kind have failed in neighbouring countries, but there are two factors in the problem either of which might in itself have been sufficient to account for these failures.

The attempts referred to were made many years ago when mangrove tannin was less in demand than it is now. The extended use of mangrove extract is of comparatively recent development, and the price has advanced accordingly.

The second factor, and it is of paramount importance, is that in very few places in the immediate neighbourhood of mangrove forests is there a large enough demand for the other product of the mangrove tree, *i.e.*, firewood, to admit of its being disposed of at a profit. It has already been stated that the Federated Malay States forests are now being worked for firewood to the full extent of their productions. They will continue to be so worked for many years whether the bark is utilized or not.

America at one time imported large quantities of cutch from Borneo. On the establishment of a similar industry in the Philippines, the Borneo business was ruined by imposition of a heavy import duty on its produce entering the United States. There is however a mangrove cutch factory still working in the Brunei district of Borneo.

The foregoing remarks refer to the forests in the Straits of Perak and Selangor only. There are similar mangrove forests of smaller area outside these two States from which bark might be obtained.

Communications are particularly good on this coast. Railways touch the coast at Port Weld and Port Swettenham. Both these ports are situated actually in the mangrove forests. Port Swettenham is visited by ocean going steamers plying between London and the far East. Before the opening of the railway from Penang to Taiping (the capital of the State of Perak) Port Weld used to be a port of call for local steamers. It is now little used as a port, but facilities for shipping of moderate tonnage still remain.

The area of forest worked for firewood annually is divided into about twelve blocks, each of which is leased to a firewood dealer for a period of one to two years. The operations of the dealer are carried out under an agreement with the Government of Federated Malay States, the agreement containing such restrictions as are

necessary to reserve the restocking of the forest. It may be mentioned that the forest leased for firewood contains the species which are most valued for tannin.

No pure *Avicennia officinalis* forest is included. In the event of the establishment of a cutch factory in the Federated Malay States the Government would be prepared to enter clauses in the firewood dealers' agreements with the object of ensuring a regular supply of bark at a reasonable rate. If it is desired to make use of *Avicennia officinalis* arrangements could be made to convey the right to work that forest also.

Enquiries on this subject may be addressed to the Conservator of Forests, Federated Malay States and Straits Settlements, at Kuala Lumpur, Federated Malay States who will supply information as it becomes available as to the results of further experiments and analyses.

Messrs. Blair, Campbell, and Messrs. Lear Ltd., of Glasgow are manufacturers of cutch making plant, and would supply specifications of all factory requirements.

MINUTES

OF ANNUAL GENERAL MEETING OF THE PLANTERS' ASSOCIATION OF MALAYA,

Held at 10.30 a.m. on April 25th 1915, at the Chamber of Commerce, Kuala Lumpur.

PRESENT:

The Hon. Mr. E. Macfadyen (in the Chair).

Mr. H. C. E. Zacharias (*Secretary*)

and the following members from constitutent.

ASSOCIATIONS:

Bagan Datoh District P. A.:—	R. H. W. Davidson.
Batang Padang D. P. A.:—	F. J. Ayris.
Batu Tiga D. P. A.:—	G. H. Bennett, H. E. G. Solbe, W. H. Bragg, Carlyle Bell, M. A. P. Gilman, T. J. Cumming.
Johore P. A.:—	Bruce Petrie, W. N. Gawler, E. D. Butler.

Kajang D. P. A.:—	R. C. M. Kindersley, E. N. T. Cummins, G. L. O'Hara Hickson, A. P. Baker, O. P. Dakeyne, E. G. Leyne.
Kapar D. P. A.:—	L. Mooijaart, E. W. King-Harman, N. Bryan, A. W. Brodie, H. Case, Noel Fisher, W. R. F. Brock.
Klang D. P. A.:—	E. B. Prior, C. A. Buxton.
Kuala Langat D. P. A.:—	H. C. D. Arcy-Irwine, R. W. Munro.
Kuala Lumpur D. P. A.:—	W. Leggatt, H. Armstrong, A. Gow, J. A. Baird, R. M. Skinner, E. W. King, C. Shelton Palmer, J. Gilbert, H. Emerson, R. C. Kinder, C. D. van Someren, M. Sharpe Smith, V. G. A. Reeve-Tucker, R. M. Newton, V. Utterson Kelso.
Kuala Selangor D. P. A.:—	J. Hunter, J. M. Booth, Thos. H. Menzies, Geo. M. Rutherford, Frank Austin, S. G. Sinclair, J. Murray, S. F. Money.
Lower Perak P. A.:—	M. Maude, T. A. Manchip.
Malacca P. A.:—	H. C. Butler, E. E. Smith.
Malay Peninsula Agr: Assn:—	R. B. Murray, A. R. Morgan, W. Duncan.
Negri Sembilan P. A.:—	A. Dupuis-Brown, P. W. N. Farquharson, W. J. Doughty, T. Slade Adams, D. B. Teale, W. Leighton, J. Bruce, V. A. Tayler, C. Ritchie, G. W. R. Miller, P. S. Stewart, W. B. Monilaws, N. F. W. Paul, T. R. Horn, A. R. Hamerton, F. T. Wynyard Wright, R. G. Turner, J. D. McCulloch, J. S. Haycroft, J. B. Douglas, Horace Brett.
Ulu Selangor D. P. A.:—	W. H. Dakeyne, M. D. Fallon, N. W. Patton, S. Harding, F. W. Davies, W. de L. Brooke.

VISITORS:

A. C. Rainnie, B. Majendie, R. D. Fenton, C. V. Doe, T. G. Hickley, J. W. Cowan, N. N. Mulloy.

The Minutes of the Meeting held on Jan. 3rd, having been printed and circulated, are taken as read, confirmed and signed.

RESUMPTION OF INDIAN IMMIGRATION.

The Secretary submits the following correspondence:—

Kuala Lumpur, 5th January, 1915.

No. 6618/1914.

Sir,

I notice from the report of your meeting of the 3rd instant that your letter to me dated the 22nd October forwarding a resolution of your Association was not acknowledged.

I much regret to find that this is correct and tender you my apology for the oversight which was, I need hardly say, entirely unintentional.

The resolution submitted in your letter was immediately placed before the Chief Secretary and has received careful consideration and I hope to be in a position to give a favourable reply shortly.

I may add that I am unable to trace your letter of the 7th December mentioned at the meeting as having been addressed to me.

I have &c.,

(Sgd.) J. F. Owen,

Ag. Under Secretary, F. M. S.

The Secretary,

The Planters' Association of Malaya.

Kuala Lumpur, 6th January, 1915.

Under Secretary, F. M. S.

Sir,

I have the honour to acknowledge receipt of your letter 6618/14 of yesterday.

I much regret that my letter of the 7th ult. has apparently gone astray and now beg to enclose a copy.

I have &c.,

(Sgd.) H. C. E. Zacharias,

Secretary.

Kuala Lumpur, January 14th, 1915.

Sir,

We have the honour to send you herewith a memorandum of the points raised at the interview you were good enough to grant us this morning, in connection with the recruiting of Indian labour.

We have, etc.,

(Sgd.) E. Macfadyen,
„ A. W. Brodie,
„ A. B. Milne.

Chief Secretary, F. M. S., Kuala Lumpur.

MESSRS. BRODIE, MILNE, AND MACFADYEN'S MEMO: OF THEIR INTERVIEW WITH THE C. S.
JAN. 14TH, 1915.

1. It is the normal experience to find labourers returning to India in numbers from October to February.

2. The figures of immigration indicate that this is now in progress, the movement set in rather late this year but is now likely to proceed with accelerated pace.

The deputation assert that to their knowledge an unusually heavy exodus is impending.

3. Normally a returning flow sets in after March. The great harvest festival corresponds, in India, to the new year among the Chinese. A fresh start is made: new engagements entered into: and from now on coolies begin to come over to this country for a further period of work.

4. This year the coolies will return to India—are doing so—as usual and will be unable to get back.

5. It is not the case that depleted labour forces can be made good by local replacement.

Retrenchment in Railway and P. W. D. new construction will affect Chinese and North Indian labourers and, if co-incident with hard times among miners, would react very seriously upon the country as a whole. But the Tamil labourers chiefly employed on maintenance works will not be very seriously affected if the Government estimates, with revotes restored, are carried out. All it will amount to is that the Departments will not make their usual draft upon the planters' labour forces.

6. Even if any considerable proportion of P. W. D. coolies were set free from employment it would not matter much to the Estates. On Jan. 1st, 1914 there were 159,666 Indian coolies employed in the Colony and F. M. S. There were 21,966 in Government employ. Putting an average year's emigration at about 60,000, it is obvious that even 25% of the Government employees would not help the Estates materially.

7. The deputation, however, assert that in any case they could only in very rare instances make any use of P. W. D. labour. Estate work is highly specialised: and the training and discipline of the P. W. D. coolies does not render them suitable for Estate employment.

8. Planters must therefore look to immigration to supply their labour as in the past. For a time their needs, which for many years had been progressively increasing, ceased to do so. This was for special reasons:—the cessation of clearing work, before tapping areas had come into bearing on a large scale: and economies in estate working explained by improved supervision, by the thinning out of trees, and generally by the necessity to work cheaply owing to falling prices.

This has gone about as far as it can and the great extensions of 1910-1912 are all coming into bearing. Labour requirements must be expected to increase again rapidly.

9. This means that any serious set-back to the magnificent recruiting system, or process, which has grown up, would be a serious disaster. But planters are already beginning to lose those recruiting connections which constitute the most valuable assets of established estates. Instances are given to show that men whose recruiting activities have been interrupted, now for nearly 6 months, and who are unable themselves to get back to their estates, have already begun to find employment elsewhere.

10. This is peculiarly unfortunate at a time when our Ceylon rivals are recruiting without interruption, and more particularly when South Indian Planters, alarmed at the emigration of the natives of the country have, within the last year or so, set up an elaborate recruiting organisation which is displaying great activity. Evidence of this is adduced.

11. The whole system of emigration to this country is consequently in serious jeopardy. But what requires immediate attention is the effects apprehended in the immediate future. The

deputation wish very seriously to warn the Chief Secretary that unless steps are taken to remove restrictions there is bound to be a shortage of labour in the near future. Coolies are going out as fast as ever and none are coming in.

12. The deputation are most emphatic in saying that if a very regrettable situation is to be avoided, the restriction must be removed at once. Unless the machinery of immigration can be got to work by March, the season will be missed: and even if it be started later the coolies will not be forthcoming. In fact a shortage is already inevitable, and the only question is to what proportions it will reach and how long it will last.

13. They point out that besides the great loss to be encountered we must expect all the concomitants of labour scarcity: crimping, absconding, the raising of rates of pay: breaches of the labour law and friction between employers and the labour department.

14. The whole of the Peninsula is unanimous. A telegram is produced from the Province Wellesley Association and the concurrence of Malacca Planters in these views is vouched for.

THE PLANTERS' ASSOCIATION OF MALAYA;
(Sgd.) H. C. E. Zacharias,
Secretary.

Office of the Controller of Labour,
No. 6 in 536/1914. S. S. and F. M. S.
Kuala Lumpur, 18th January, 1915.

Sir,

I have the honour to inform you that it has been decided to resume the granting of assisted passages to labourers from the Madras Presidency, but that such assisted passages are for the present to be limited to the fortnightly mail steamers from Madras and Negapatam.

2. Instructions have been issued to the Emigration Agents in India to receive emigrants in the depots for shipment as indicated above.

I have &c.,
(Sgd.) E. S. Hose,
Ag. Controller of Labour, F. M. S.

The Secretary,
Planters' Association of Malaya.

Copy of Telegram dated 19/1/15.

"Government advise Indian Immigration being resumed im-
"mediately, please inform your members. Zacharias."

Copy of letter sent to all Papers in S. S. and F. M. S.

The Editor, Kuala Lumpur, 19th January, 1915.

.....

RESUMPTION OF INDIAN IMMIGRATION.

Dear Sir,

I have been officially informed that it has been decided to resume the granting of assisted passages to labourers from the Madras Presidency, but that such assisted passages are for the present to be limited to the fortnightly mail steamers from Madras and Negapatam.

Believe me, etc.,
(Sgd.) H. C. E. Zacharias,
Secretary.

Kuala Lumpur, 30th January, 1915.
(Posted Feb. 19th, 1915).

No. 14 in 6618/14.

Sir,

I am directed to acknowledge the receipt of your letter of the 6th January, 1915, on the subject of resumption of Indian Immigration and to say that, as indicated in my letter of the 5th January, the matter has been satisfactorily decided.

I have &c.,
(Sgd.) A. Caldecott,
for Ag. Under Secretary, F. M. S.

The Secretary reads the following Resolution received from the Ulu Selangor District Planters' Association:—

"That the Immigration Authorities be approached by the Standing Committee of the P. A. M. with a view to these authorities making it known in the recruiting districts of the tranquil state of this country and that recruits be re-assured of a safe Passage from India."

This in the opinion of the mover of the resolution was necessary as the number of coolies now arriving was very small considering the number of recruiters now at the coast, and it was highly probable that the unsettled state of this country in the early part of the war was thought in India still to continue.

Mr. *Macfadyen* remarks that Mr. Newton, of the Madura Company, had sent a telegram to the effect that coolies were now coming forward in increasing numbers, but it was the opinion of the Managers of the Company in Negapatam that owing to the general state of unsettlement due to the war, and also to the good harvests in India, it must be expected that for the rest of this year shipments would probably be about 25 per cent below the normal.

Mr. *W. de L. Brooke* supports the Ulu Selangor resolution and suggests that the Immigration Committee be asked to advertise over in India pointing out the settled state of affairs in the F. M. S. now.

Mr. *Kindersley* questions whether that might not have the opposite effect, and create distrust. He thought it better that anything in that direction should be done by spreading the news through the Madura Company.

Mr. *Brooke* proposes that the Secretary write to the Indian Immigration Committee, putting forward the suggestion.

This is seconded by Mr. Patton and carried.

Resumption of Chinese Immigration.

The Secretary reads two resolutions received by him on the subject:—

From *The Negri Sembilan Planters' Association*:

"That the Planters' Association of Malaya be requested "to approach the Government to permit unrestricted Chinese "immigration immediately in view of the prevailing shortage "of coolies."

The N. S. P. Association was aware that the Straits Settlements Government is allowing steamers from certain parts in China to bring passengers to one third of their carrying capacity, but they considered this insufficient.

From the *Kajang District Planters' Association*:

"That this Association desires to call the attention of the "P. A. M. to the large and increasing number of Estates in "this District and in other parts of the Peninsula which em-

"ploy Chinese labour. In view of the large areas of Rubber "that will come into bearing in the years 1915 and 1916, and "of the present remunerative price of tin, this Association "considers that there is a probability of a serious shortage of "labour in the near future. The members of this Association "therefore are of opinion that the Government should be ap- "proached with the object of urging on them the advisability "of permitting the resumption of Chinese Immigration."

Mr. *McCulloch* formally proposes that a resolution be forwarded to the Government in favour of Chinese immigration being resumed in full.

He would take this opportunity of refuting certain insinuations made in a leader, which had appeared in the *Straits Times* of April 20th.

One passage was:—"While it may be very agreeable for the estate managers to have a reserve of twenty-five to fifty thousand men to draw upon, it is by no means pleasant for the Government to feel that such numbers of men, of a type easily led in to mischief, are wandering at large." That was ridiculous. They as planters knew that there was no such surplus or anything approaching it. In Negri Sembilan the position was such that it was practically impossible to obtain a new gang of 50 Chinese unless one stooped to crimping them from one's neighbour. Further on the article said :—"It is not enough to say that estate managers find it harder to get labour now than they did a year ago. We all know that; we all know the reasons for it; we all know that rates of pay were lowered and tasks increased." That statement was false. In Negri Sembilan six months ago they had reduced wages to 50 cents and in some instances increased tasks,—though they still maintained that the coolie did not do a fair day's work,—but there had been no difficulty as regards labour until quite recently. There had been no trouble or discontent in connection with the reduction of wages or increase of task, and the present shortage of coolies was entirely due to the restrictions on immigration. Continuing, the *Straits Times* said :—"Is it or is it not a fact that all over the Peninsula the proportion of coolies to Europeans is very much greater than it was, though the pay of the coolies has been reduced and his task increased?" Again the same insinuation. "Are the companies making any effects to strengthen European staffs,—are they not endeavouring rather to economise under that head?" That

they all knew to be untrue, it was decidedly not a matter of economy. Patriotic motives had led to a portion of their staffs going home to the war, and it was practically impossible at present to fill the vacancies with suitable men. The question of economy did not come into the matter at all. He thought the meeting should express its opinion that those statements he had referred to were not justified by the facts.

Mr. *Kindersley* seconds the proposal, although he was aware of the complicated nature of the question. The difficulty was of course that Chinese labourers were not exclusively, and not even mainly, employed on Estates, but on mines. Tin prices are high at present, otherwise there would undoubtedly be a surplus of Chinese labour.

Mr. *Tayler* supports the proposed Resolution and emphasises the urgency of the matter.

Mr. *Gawler* is personally strongly in favour of unrestricted Chinese immigration being resumed as quickly as possible, but thinks the question arose as to whether it was desirable to go on in the same old style passing these pious resolutions and sending them into Government and having them pigeon-holed. Would it not be better to ask the Governments of the F. M. S., S. S. and Johore to consent to the appointment of an Advisory Committee on labour matters. Details of such a scheme could very readily be worked out if they agreed to the principle.

Mr. *Smith* observes that Malacca estates fully endorsed the Resolution as put forward by the Negri Sembilan Planters.

Mr. *Cummins* points out that the increase of rubber coming into bearing equalled one third of the planted acreage.

The motion, as proposed by Mr. McCulloch and seconded by Mr. Kindersley, is passed.

Mr. *Gawler* proposes as a further motion, that the Governments of the F. M. S., S. S. and Johore be approached with a view of establishing a permanent Advisory Labour Committee.

Mr. *Butler* seconds the motion, which is carried.

Absconding.

The Secretary submits the following correspondence :—

Batu Tiga District Planters' Association.

Batu Tiga, 8th January, 1915.

The Secretary,

Planters' Association of Malaya.

Dear Sir,

Referring to my letter of the 24th ult., I enclose a copy of a letter I have received from the Secretary to the Resident."

I am, etc.,
(Sgd.) R. F. Talbot,
Hon. Secretary.

Office of Secretary to the Resident,
Selangor.

5th January, 1915.

Sir,

Referring to your letter of the 24th December I have the honour to inform you that the Harbour Master at Port Swettenham is a Magistrate of the First Class and can issue Warrants of Arrest.

I have, etc.,
(Sgd.) O. F. Stonor,
Secretary to Resident.

It was also noted that the Harbour Master, Teluk Anson, is a Magistrate of the First Class.

The Commissioner of Police, F. M. S.

Kuala Lumpur, 19th January, 1915.

Sir,

I have the honour to enquire what the present routine is in regard to the execution of warrants in the case of persons who have left the district of the Magistrate who issued the warrant.

The Criminal Procedure Code provides that a warrant of arrest *may* be executed by any Police Officer of any of the Federated Malay States, but I should be glad to know whether it is the actual practice to post such warrants to the nearest Police Station concerned or not. Taking an imaginary case: if the Magistrate at Kuala Selangor issues a warrant for the arrest of a person who, since committing the offence in question has gone to live near

Rawang: does the Police Officer in charge at Kuala Selangor post the warrant to the Police Officer in charge at Rawang; or does he post it to the District Officer of Ulu Selangor at Kuala Kubu.

If the latter is the case, it is obvious that a good deal of time is wasted and that the escape of the offender is greatly facilitated.

A further point arising out of my enquiry is whether the practice whatever it is, is uniform throughout the Federated Malay States?

I have, etc.,
(Sgd.) H. C. E. Zacharias,
Secretary.

Office of the Commissioner of Police,
Federated Malay States.

22nd January, 1915.

Sir,

Replying to your letter dated 19th January current I have the honour to inform you that all warrants of arrest are sent by the Police Officer receiving them from the Courts, to the officer in charge of the Police District in which the offender is believed, or suspected to be, if he is not in the district in which the warrant was issued. This procedure applies within the Federated Malay States only. Warrants are not sent to District Officers or to Magistrates or to other administrative officers.

2. The practice is uniform throughout the Federated Malay States. As however I presume you have some reason for your enquiry I will remind all Police Officers of the Procedure.

I have, etc.,
(Sgd.) W. L. Conlay,
Deputy Commissioner,
Ag. Commissioner of Police, F. M. S.

The Secretary,
The Planters' Association of Malaya.

Chairman, Kuala Selangor D. P. A.

Kuala Lumpur, 3rd February, 1915.

Dear Sir,

I thank you for your favour of the 29th ult. and for putting the issue so clearly before me.

As regards my letter to the Commissioner of Police, I may say that I have reason to believe that the service of warrants will be smartened up in future, as far as the Police Department is concerned and it will certainly further help matters a good deal, if planters will make it a rule of complaining to the C. P. O. of the State, whenever they come across a case of undue delay.

But I quite understand now, where the real difficulty lies. As you say, it would in any case obviate much trouble and delay, if warrants of arrest could be obtained from the Magistrate nearest to the place where the offenders are discovered. The law of course is that all Magistrates have the authority of issuing such warrants, but in practice there is apparently some reluctance, on the part of some Magistrates to exercise the authority given to them.

The remedy would therefore seem to be to adduce a concrete case, in which a magistrate has refused to issue a warrant although the information sworn before him was of such a nature, as must be held reasonably sufficient, to satisfy him of the property of issuing a warrant.

The person swearing the information must of course be able to swear (1) to the identity of the offender and (2) to the facts of the offence, *i.e.* must be personally aware of the circumstances, in which the alleged offender left his estate. If however the information on these two points is clear and if further it can be shown that the offender is at the time in the district of the magistrate applied to, I am advised that it would be held unreasonable on the Magistrate's part to refuse the issue of a warrant; and that such refusal would form the matter of legitimate complaint to the Public Prosecutor.

The modus operandi for us therefore would be to get hold of a good test case and it is a pity that in your Batu Tiga case the Kangany concerned has since absconded and is therefore not available for giving further evidence. When a fresh case is taken, it might perhaps be advisable to obtain the help of an advocate when applying for a warrant, so that we may be sure to comply with all the technicalities of the law.

Believe me, etc.,

(Sgd.) H. C. E. Zacharias,

Secretary.

Secretary to P. A. M.

Kuala Selangor, 6th February, 1915.

Dear Sir,

I am much obliged for your favour of 3rd inst.

I have now, thanks to your trouble, a clear statement of the matter to put before the members of my Association. I can only hope that a good case will shortly occur so that we can firmly establish our claim.

Again thanking you for your kindness and trouble.

Believe me, etc.,

(Sgd.) L. A. Irving,
Chairman, K. S. D. P. A.

Mr. *Macfadyen* thinks that two points seemed to have been made clear; that both at Teluk Anson and Port Swettenham one could go to the Magistrate on the spot and get a warrant for an absconder; and secondly, that if a Magistrate unreasonably refused to issue such a warrant, complaint should be made to the Deputy Public Prosecutor.

Mr. *Bennett* remarks that the fact of the Harbour Master at Port Swettenham being a first class Magistrate, was of little practical help, since the Harbour Master was usually out in the Harbour and ordinarily un-get-at-able. He considers that at least on days when ships were leaving for India a Magistrate qualified to issue warrants should be available at Port Swettenham, and suggests that the Standing Committee take up the matter.

Agreed to.

CRIMPING.

The *Secretary* reads the following letter received from their legal advisers:—

Kuala Lumpur, 6th March, 1915.

Dear Sir,

"re Appeal by Panicker . .
on a Charge of Crimping."

Judgment was delivered in this case to-day by a majority of Bradwell and Edmunds, J. J., Innes, J. dissenting. The appeal was allowed.

Mr. Justice Braddell found that the facts did not amount to the Defendant doing any act which was not legal and further that in any case the fact that the inducement was directed to the

giving of legal notice did not bring the Defendant within the section under which he was charged. Mr. Justice Edmunds agreed with Mr. Justice Braddell in the latter point.

Yours faithfully,

(Sgd.) Drew and Napier.

The Secretary,

Planters' Association of Malaya.

Mr. *Macfadyen* reports having promoted a private bill (Draft Enactment gazetted sub. No. 930 on April 12th, 1915), to meet the consequences of this judgment, but he was afraid that there would be no opportunity for considering it at the forthcoming Federal Council Meeting.

Outside Employment on Sundays.

Mr. Macfadyen remarks that the bill just mentioned by him covered likewise their requirements under this heading.

The Secretary submits the following correspondence:

Kuala Lumpur, 6th January, 1915.

Controller of Labour, F. M. S.

Sir,

I have the honour to draw your attention to the wording of certain section of the Labour Code, which as recently interpreted by the Supreme Court, apparently allow of estate labourers being employed by others than their regular employers on Sundays and holidays on which they were not bound to work for their regular employer, *i.e.* those employers to whom they are bound by an agreement or contract.

The members of my Association feel that if stated days of rest are beneficial to the labourer, it is highly desirable that the provisions of the law to that effect should not be rendered nugatory, as is now the case. If on the other hand such rest is deemed superfluous in the interests of the labourer, it is surely only right that his services should be restricted to the employer, whose lines he inhabits, whose hospital he resorts to in time of sickness, whose school his children are attending, who is enabling him to earn a fair wage on all other days of the year and who on his behalf is paying a good deal of money to the State by way of taxes and assessments.

I have therefore been instructed to submit the desirability of enacting a new section (following 99), as follows:

99*a*.

(i) No labourer who shall under this Enactment be bound by an agreement or contract with an employer for a period not exceeding one week shall during the continuance of such agreement or contract work for any person other than such employer on any day upon which the labourer shall not be bound to work for the said employer or on any day upon which he shall be entitled to absent himself from work for the said employer or on any holiday, and no person other than such employer shall employ any such labourer upon any of such days or holidays as aforesaid.

(ii) Any labourer acting in contravention of the provisions of sub-section (1) of this Section shall be liable on conviction to a fine not exceeding $1, and any person employing a labourer in contravention of the provisions of sub-section (i) of this section, shall be liable on conviction to a fine not exceeding $5.

I have, etc.,
(Sgd.) H. C. E. Zacharias,
Secretary.

Office of the Controller of Labour,
S. S. and F. M. S.
8th January, 1915.

Sir,

I have the honour to acknowledge the receipt of your letter of 6th instant on the subject of the outside employment of labourers on holidays.

2. I understand that the question raised in your letter originated in a case in which a conviction was obtained in the Seremban Police Court against a person for employing labourers who were bound by agreement to serve another person, which conviction was upset in the Supreme Court on appeal, but I understand that the case cannot be regarded as a leading case on the point at issue.

3. I would suggest, therefore, that before pressing for an amendment of the law, your Association should take the first opportunity afforded of bringing another case of the same nature before the courts for decision.

4. Section 225 (i) (*b*) of the Labour Code provides that no person shall take into his own employment any labourer bound by agreement to serve another person. This prohibition, if enforced, should be ample protection for an employer, without prescribing any more direct restrictions on the liberty of the labourer.

I have, etc.,

(Sgd.) E. S. Hose,

Ag. Controller of labour, F. M. S.

The Secretary,

Planters' Association of Malaya.

Kuala Lumpur, 11th January, 1915.

Dear Sir,

We have considered the letter of the 8th instant from the Controller of Labour.

First, we think a Magistrate is bound by the High Court's decision whatever explanation is given to him by anyone as to the course followed in court. The explanation would no doubt be of use in another case on the same point, in the High Court as an argument against the Court necessarily following the decision, but should be of no avail in the Magistrate's court.

With regard to the Controller's interpretation of Section 225 (i) (*b*) of the Labour Code, while the words are perhaps wide enough to include the act in question, the result of such an interpretation would be that persons who employed a labourer bound by agreement or contract to serve another person at a future time or at stated times with intervals of (for instance) a week between them, would be guilty of an offence under the sub-section. We are of opinion that such an interpretation could not be supported.

The marginal note to Section 225 is "Crimping." This forms no part of the Section and is not used in interpreting the section but it is used to show the drift of the section. It cannot be said that the act in question is of the nature of crimping. Further in construing the section the Court must endeavour to discover what mischief it is intended to remedy. There is nothing in the section or the Enactment to show that the act in question was a mischief

that was intended to be remedied and clauses (*a*) and (*c*) of section 225 (1) seem to us to affect the interpretation of clause (*b*), for clause (*b*) is really a corollary of clause (*a*), or at least the next step after the act dealt with by clause (*a*).

For these reasons, we are of opinion that the interpretation of Section 225 (1) (*b*) is that an offence is only committed where the labourer is, at the time when he ought to be working for his real employer, employed by another person knowingly.

We return the Controller's letter of the 8th instant.

Yours faithfully,

(Sgd.) Drew and Napier.

Secretary, Planters' Association of Malaya.

Kuala Lumpur, 13th January, 1915.

The Controller of Labour, F. M. S.,

Kuala Lumpur.

Sir,

I have the honour to acknowledge receipt of your letter 2/22 and to enclose for your perusal counsel's opinion we have obtained on the legal points raised by you.

In the circumstances I am directed to inform you that this Association has no alternative but to press for a specific amendment of the Labour Code, as originally submitted.

I have, etc.,

(Sgd.) H. C. E. Zacharias,

Secretary.

(Enclo.)

Office of the Controller of Labour,

S. S. and F. M. S.

Kuala Lumpur, 18th January, 1915.

Sir,

I have the honour to acknowledge the receipt of your letter of the 12th instant on the subject of the employment of labourers by persons other than those whom they are engaged to serve under an agreement.

2.- I have submitted the correspondence for the consideration of the Government.

I have, etc.,

(Sgd.) E. S. Hose,

Ag. Controller of Labour, F. M. S.

The Secretary,

Planters' Association of Malaya,

Kuala Lumpur.

Office of the Controller of Labour,

S. S. and F. M. S.

18th February, 1915.

Sir,

With reference to my letter of even number dated the 18th ultimo on the subject of the employment of labourers by persons other than those whom they are engaged to serve under an agreement, I am directed to inform you that if and when further amendments are made to the Labour Code, the advisability of amending the provisions referred to in this correspondence will be considered.

I have, etc.,

(Sgd.) E. S. Hose,

Ag. Controller of Labour, F. M. S.

The Secretary,

Planters' Association of Malaya.

Export Duty.

The *Secretary* submits a table of calculations.

Mr. *Macfadyen* thinks they would agree with him that with a view to making a really strong case it was quite worth while submitting to the delay involved in collecting reliable information over a considerable period. In order that they might be in a position to meet the argument that would probably be put forward by Government that the Singapore value was not the same as the London value they were, by the kindness of merchants here, obtaining figures of typical account sales of rubber sold in London which was shipped on the same dates as the shipments from Singapore. It would not be many weeks now before that information was avail-

able, and he thought it would be agreed when they had that information they had a very complete case indeed, and one which would make it very difficult for the Government to refuse redress when they were able to demonstrate by figures the injustice which had been made.

AGRICULTURAL DEPARTMENT.

The Secretary reads the following correspondence:—

CENTRAL PERAK PLANTERS' ASSOCIATION.

Ipoh, 1st April, 1915.

The Secretary,

Planters' Association of Malaya.

Dear Sir,

The following resolution was passed at the Annual General Meeting of the above Association held in Ipoh on March 20th, 1915:—

"That this Meeting views with dissatisfaction the control of pests and diseases as carried out by the Agricultural Department and that District Associations be solicited to support a resolution asking the parent Association of Kuala Lumpur to bring the necessity of better attention and general efficiency to the notice of the Government."

Will you be so good as to bring this matter to the notice of your Committee, and inform us as early as possible of your views?

Yours faithfully,

(Sgd.) C. Matthew,

Secretary.

Mr. *Macfadyen* says a telegram had been received from Mr. Milne, the president of the C. P. P. A., regretting his inability of being present. As no other Central Perak representatives were present, he took it therefore that the Ipoh planters were really not very anxious to go on with the matter, having probably recognised in the meantime that their best remedy lay in representing their complaint to the Director of Agriculture, when he felt confident matters would be put right in this respect.

He should like in this connection to qualify certain remarks of his, quoted in a newspaper, on this subject at a recent meeting of the Perak Association. The remarks were relative to the disappointment which planters had felt in respect of the vulcanising plant established at the Agricultural Department factory. He did not think he misrepresented things in the least when he said, as he did them, that planters were very disappointed, since their expectations of the work which would be done for the estates had certainly not been fulfilled. When it was first set up they all thought it would rapidly develop into a testing station which would be able to give certificates and some account of the value of rubber samples sent by estates. Probably, in fact no doubt, these expectations were unreasonable. There was too much scientific spade work to be done in preparing the ground for any such practical testing station, before it could settle down to regular routine work. He had lately had an opportunity of perusing a paper by the Government Agricultural Chemist which to a layman certainly appeared to contain a record of very promising research work on the vulcanising properties of different rubbers. They ought not to expect results of scientific work too rapidly, he supposed, and he took the opportunity of saying it had been made perfectly evident to him that a great deal of work at any rate had been done at the Government factory on this plant since it had been established, and that the results obtained would very much interest people when they were published, and really did appear to contain hints of very distinct value on the treatment of rubber. (Applause.)

Currency.

The *Secretary* reports the issue of a circular and the receipt of replies from the various Constituent Associations as follows:—

Kuala Lumpur, 26th March, 1915.

(*Circular letter to all Secretaries.*)

Dear Sir,

Reverting to the printed Minutes of our last meeting (of Jan. 3rd), I beg to draw your attention to pp. 18/22 and to the resolution then put forward by Mr. Leggatt.

As you will notice, action on the lines of this resolution was deferred pending further information being obtained from all Constituent Associations, as to how much additional half—and quarter-cent coins in their opinion were required and could be put in circulation.

The date of our next meeting has been fixed for April 25th and I shall therefore be glad if you could kindly let me have your views on this point ere then.

Thanking you in anticipation.

Believe me, etc.,

(Sgd.) H. C. E. Zacharias,

Secretary.

ULU SELANGOR DISTRICT PLANTERS' ASSOCIATION.

This matter was discussed at some length and it was agreed that this district would put into circulation once a month coins of ½ and ¼ cent denomination to the amount of $53.

KUALA LUMPUR D. P. A.

At a meeting of this Association held on Saturday last, I was instructed to inform you that it was the opinion of the meeting that the members of the association could put into circulation fifty dollars worth of each coin—¼ and ½ cent—monthly.

NEGRI SEMBILAN PLANTERS' ASSOCIATION.

With reference to your letter of 26th March, at the General Meeting of my Association held to-day, Members expressed their willingness to put into circulation through their labour forces about $50 monthly of the half and quarter cent coins in equal proportions.

BATU TIGA D. P. A.

At a meeting of this Association held on the 10th inst. it was considered that ½ and ¼ cent pieces to the amount of $50 will meet the requirements of this district.

KLANG D. P. A.

The Estates in this Association could put into circulation about $10 per month of half and quarter cent pieces.

JOHORE P. A.

Referring to your letter of the 26th March re 'Currency,' I have circulated my members, and all the replies received to date are emphatically in favour of Mr. Leggatt's motion.

KAJANG D. P. A.

Although this Association are in favour of the idea of smaller coinage they are unable to say what number of these coins could be put into circulation in the District.

MALAY PENINSULA AGRICULTURAL ASSOCIATION.

Your letter of the 26th March was duly considered at a Meeting of the Committee of the Malay Peninsula Agricultural Association held on Saturday last, when we were instructed to write expressing agreement with the lines of the resolution put forward on this matter at your last meeting and to inform you that our Committee are of the opinion that an issue of half and quarter cent coins in the proportion of 5% and 2½% respectively of the present bronze currency, should meet requirements.

BATANG PADANG D. P. A.

Responses to my circulars to Managers of Estates in this District shew what we are prepared to circulate each pay day $200 worth of ½ and ¼ cent pieces, provided:—

(1) that they be issued by both banks (Chartered and Hongkong) in Ipoh.

(2) that they be declared legal tender up to rolls of 50 cents value.

Kindly state these two conditions, as from us, when item 7 of the Agenda is discussed at the P. A. M. General Meeting on 25th inst.

KELANTAN P. A.

Your letter re Currency was considered at a general meeting yesterday. It was agreed that, as here a small coinage was tried not very successfully, and the subject—a very interesting one—requires much consideration. We cannot at present participate in any general distribution of coin. Some of the small coinage here is made in Kelantan.

KUALA SELANGOR D. P. A.

The following is what my Chairman has to say on the matter of currency: The introduction of half cent pieces might tend to the reduction of coolies' living in this country but I consider that quarter cents are both necessary and undesirable. I would be against planters being requested by the P. A. M. to distribute these coins as part cooly pay and if half cent pieces are to be currency they should be allowed to be distributed throughout the country naturally instead of artificially as would be the case if forced on coolies on pay day. By so doing the value of these coins or their want of value could be gauged to a greater extent than if they were issued wholesale by planters.

With reference to your letter of 26th ulto: from our own experience we are of opinion that the issue of ½ cent and ¼ cent coins is not necessary in this Settlement. We presume however the need is only felt on Estates employing Tamil coolies, but it would appear to us that the difficulty could be got over to a great extent by making arrangements through their respective shops. We have asked the opinion of the Bank Managers in Malacca and Singapore, and we are informed that any issue of such coins would be strongly opposed by them.

Mr. *Duncan* while agreeing that the more general use of ½ and ¼ cent pieces might tend to cheapen the cost of living, considers the question a difficult one for them to decide there and then. He would propose that a Sub-Committee go into the matter and report on the replies received; and that such Sub-Committee consist of Messrs. Leggatt and McCulloch.

Mr. *Maude* seconds the proposal, which is carried.

FATAL ACCIDENTS.

The Secretary reads the following correspondence:—

Kuala Lumpur, 6th January, 1915.

Under Secretary, F. M. S.

Sir,

I have the honour to draw your attention to the desirability of introducing at an early date an Enactment for compensating the families of persons killed by accidents, on the lines of the English Act, 9 and 10 Victoriae, cap. 93.

As advised, no action at law is now maintainable in the Federated Malay States against a person, who by his wrongful act, neglect or default may have caused the death of another person; although the wrong-doer is already answerable in damages for the injury so caused by him, provided such injury does not result in the death of the injured person.

It is clearly of importance that the present anomaly of the local law be forthwith remedied, enabling in future the dependants of a mortally injured person to maintain in these States, as is already the case in most other parts of the Empire, an action and recover damages, as the injured person himself would have been

entitled to maintain and recover, if his injury had not resulted in death; and I am instructed to submit that a Bill to that effect be placed before the Federal Council at their next Meeting.

I have, etc.,
(Sgd.) H. C. E. Zacharias,
Secretary.

Kuala Lumpur, 9th April, 1915.

Sir,

Referring to your letter dated 6th February, suggesting that a Bill to enable Dependents of a mortally injured person to maintain an action and recover damages should be placed before the Federal Council at their next Meeting, I am directed to inform you that the Government has considered this suggestion but does not propose at present to introduce such a Bill.

I have, etc.,
(Sgd.) J. F. Owen,
Ag. Under Secretary, F. M. S.

The Secretary,
Planters' Association of Malaya.

QUITRENT.

The *Secretary* reports the receipt of the following resolution from the Negri Sembilan Planters' Association:

> "As a promise was made by Government to grant some "relief from the existing onerous rent terms, and under the "Country Lands Cultivation Enactment such relief is not "granted to those Estates where the conditions of cultivation "have been more than fulfilled, it is the opinion of this As- "sociation that the P. A. M. should use every endeavour to "obtain an amendment of the law at an early date, to in- "clude such estates."

Mr. *Macfadyen* explains that there appeared to have been at first some misunderstanding on this point in Government circles, but that since then the High Commissioner had ruled that the relief was meant to apply to all estates, irrespective of whether they had or had not already more than fulfilled the new cultivation clauses. The only properties, which did not come under this ruling, were

those, whose owners had since surrendered part of the original area granted. The question of whether or not relief should be extended to them, was to be considered on the individual merits of each case, but he believed that it would, provided the surrendered land was taken back. In any case the properties affected were exceptional cases and very few in number.

Mr. *Tayler* expresses himself as completely satisfied with the information given and the good results achieved by Mr. Macfadyen's efforts in that direction, and says the thanks of the Association were due to him for his successful intervention. (Applause.)

The resolution of the Negri Sembilan P. A. is withdrawn.

F. M. S. Convalescent Home.

Mr. *Macfadyen* announces that as the result of a collection made during a smoking concert held the previous night, a sum of $1000 had been obtained from the above Fund.

Report and Accounts.

The *Chairman* having formally presented the Report and Accounts for the past year, invites questions.

There being no discussion, Mr. Tayler proposes and Mr. King-Harman seconds, that the Annual Report of the Standing Committee be adopted.

On the motion of Mr. Quartley, seconded by Mr. McCulloch, the Accounts for the past year are passed.

Chairman.

Mr. *Macfadyen* announces that the only candidate nominated for the Chair, was Mr. William Duncan of Caledonia fame, whom it would be an impertinence to introduce to them. In vacating the chair, he would therefore content himself to congratulate the Association on having secured for the chair one of the most experienced planters and one of the soundest business men in the whole country.

Mr. *Duncan,* in taking the chair, proposed a vote of thanks to the retiring Chairman, Mr. Macfadyen. (Prolonged applause.) Although in the past the Association had had chairmen who had been very capable and very able, he thought perhaps they would agree with him that none of them had been more so than Mr. Macfadyen and certainly no one could have applied himself with more energy or more ability to the duties of Chairman. (Applause.)

STANDING COMMITTEE.

The ballot for a Standing Committee of five members for the current year then takes place.

Messrs. Quartley and McCulloch having been appointed scrutineers, the Chairman announces the result as follows:—

Messrs. Macfadyen, Quartley, Munro, Kindersley, H. M. Darby.

PLANTERS' BENEVOLENT FUND.

The following ten gentlemen are nominated to serve on the Standing Committee of the Corporation:—

Rev. W. S. Kelley, Messrs. H. R. Quartley, A. Dupuis-Brown, J. G. Cruickshank, W. R. F. Brock, R. W. Munro, E. Macfadyen, H. E. G. Solbe, P. de C. Morris, A. P. Robinson.

There being no other nominations, the Chairman declares the above duly elected.

SECRETARY.

Mr. *Macfadyen* moves that Mr. H. C. E. Zacharias be re-appointed Secretary for the current year.

Mr. *Leggatt* suggests that it might be preferable to appoint, not Mr. Zacharias personally, but his firm.

Mr. *Dupuis Brown* seconds Mr. Macfadyen's proposal.

Mr. *Leggatt* having withdrawn his amendment, the original motion is carried unanimously.

ESTIMATES FOR 1915/6.

The *Secretary* present the following budget for the current year:

EXPENDITURE.		REVENUE.	
Secretary	$3,000.00	Subscriptions ..	$5,200.00
Library	100.00		
Postage & Telegrams	300.00		
Agricultural Bulletin	500.00		
Printing & Stationery	250.00		
Office Rent ..	400.00		
Legal Advice ..	500.00		
General Charges and Contingencies ..	150.00		
	$5,200.00		$5,200.00

Mr. *Dupuis-Brown* proposes, Mr. *Kindersley* seconds and it is carried unanimously that the above estimates be passed and that the subscription be fixed again at $100 per delegate for 1915/16.

Mr. *Munro* would take the opportunity of asking Constituent Associations not to cut down the number of delegates, as the P. A. M. finances could by no means stand any further weakening, as was evident from the Estimates just passed.

Mr. *Duncan* endorses Mr. Munro's remarks.

Date of Meetings.

Mr. *Mooijaart* proposes that the Meetings of the P. A. M. be in future held on a weekday and not on Sundays, as had hitherto been the practice.

Mr. *Cummins* seconds the proposal and observes that if meetings were held on a Saturday or Sunday, members attending could combine no other business with their visit to town on that day, thus wasting more time.

Mr. *Macfadyen* hopes that meetings will be held in the early part of the week and avoid clashing with mail days.

Mr. *McCulloch* invites the Association to hold their next meeting at Seremban.

Mr. *Mooijaart's* proposal is then put to the vote and carried; and the next meeting fixed for June 30th at Seremban.

Sunday Labour.

The *Secretary* reads the following letter:—

Bishop's Lodge,
Singapore, 10th February, 1915.

The Secretary,
Planters' Association of Malaya.

Dear Sir,

At the Annual Conference of the Clergy of this Diocese held in January, an opinion was expressed that something should be done to diminish Sunday labour on Rubber Estates in this Peninsula. It was pointed out that at our Diocese Conference 2 years ago an able paper was contributed by Mr. Eric Macfadyen, then

I believe President of the P. A. M., in which he held out the hope that as the estates became further developed, Sunday labour would diminish. It was however felt by those who are chaplains in planting districts that this hope has not at all been realised.

A wish was expressed that I should write to you to say that during my approaching visit to England, I should like to bring the matter before the Rubber Growers' Association first and I would like to know whether you see any objection to my doing so, and whether you would give me any expression of your opinion of which I could make use when writing to the Rubber Growers' Association.

I leave for England on the 18th of this month. As probably your Council will not be able to consider the matter before then, I should be obliged if you will forward your answer to me at 14, Stanley Gardens, Notting Hill, W., England.

Yours faithfully,

(Sgd.) C. J. Singapore.

Mr. *Duncan* remarks that he understood the Bishop referred to European labour only. If so, he was probably not aware that the amount of work done on a Sunday by the average assistant was anything but exhausting. However, to do whatever little work had got to be done on a Sunday, had been a custom in this country for many years, and one that would die hard. He for one did not view the Bishop's interference with much favour.

Mr. *Maude* holds it had only started since the coming of the rubber industry. It had not been done in the old days of coffee, etc. In England, where the climate was very much better, work was not allowed by the Government to be done on Sundays. He should like to see Sunday work entirely abolished. (Applause.) The assistants went out in a half-hearted sort of way, and so did the coolies, and a great deal of damage was undoubtedly done to the trees on Sundays. In this climate everyone ought to have one day's holiday during the week. In three or four more years there would probably be an over-production of rubber throughout the F. M. S. and Ceylon. In Sumatra planters had two days off a month by order of Government, on which no one was allowed to work. The R. G. A. were there to try and make all the money they could for the shareholders. He personally would lose money by stopping Sunday labour, as he was also an owner and not only a manager.

but he was quite prepared to do so. He considers it only fair that young chaps who came out and worked jolly hard all day long should be given one day's rest in the week. (Applause.)

The *Hon. Mr. Macfadyen* proposes that they reply that they saw no objection to the Bishop approaching the R. G. A. in the sense indicated.

Mr. *Dupuis-Brown* in seconding asks for a definition of Sunday work. His severest work for many years on a Sunday was playing the organ, which was far more exhausting than working on the estate. (Laughter.)

The Meeting agrees to Mr. Macfadyen's proposition as to reply to be sent to the Bishop of Singapore, but on the larger question involved, it was resolved at the suggestion of Mr. Mooijaart, to bring up again the matter at their next meeting.

R. G. A.

The *Secretary* reads the following correspondence:—

"Rubber Growers' Association."

London, E. C.

11th December, 1914.

Dear Sir,

At a recent meeting of the Council of the Rubber Growers' Association the question of having representatives in the rubber growing Colonies and States was considered, and it was unanimously decided that the industry would materially benefit by such representation.

It was felt that it would be necessary to form new Associations if it were found possible to work with the existing organisation, and I was requested to ask if your Association can see its way to appoint a small Committee to act in the manner herein suggested.

I enclose an extract from the Minutes to show what is in the mind of the Council and these of course are merely directory and not necessarily to be considered hard and fast rules for forming the Committee.

The work as representatives of this Association would consist in bringing before the Council all and sundry matters that may suggest themselves for the good of the Industry in general and Malaya in particular, and keeping it advised upon any matters of importance which from time to time may arise.

The policy of the Colonial Office appears to be to grant to the local Governments a large measure of freedom when dealing with matters affecting the Plantation Rubber Industry, and indications have been given that representations made by recognized bodies in the various Eastern Colonies and Dependencies would be welcomed.

You will see in the extract from the Minutes how we propose that the finance should be dealt with, and I will be pleased to receive suggestions from your side in regard to this.

It is the desire of the Council to co-operate cordially with the Malaya representatives as it is felt that a mutual exchange of opinions upon the many points which periodically arise will be of immense benefit to the industry as a whole .

Yours faithfully,

(Sgd.) F. Smith,
Secretary.

Enclosure to letter to Planters' Association of Malaya.

At a meeting of the Council of the Rubber Growers' Association (Incorporated) held on the 2nd November 1914, the following report of the Committee appointed to consider the advisability of obtaining direct representatives of the Association in Malaya and Ceylon was unanimously adopted:—

Report of Committee.

Resolved:—

That the Committee are of opinion that it is desirable to arrange for representation of this Association in Ceylon and the Malay States.

They are of opinion that the best means of arranging for this is as follows:—

That the Planters' Association of Malaya be asked to appoint a small Committee consisting of eight planting Members in conjunction with four mercantile Members to be appointed by the local Chambers of Commerce.

The Secretary and Chairman of the Planters' Association to be members ex-officio.

Such Committee to act as advisers and correspondents of the Rubber Growers' Association as well as their representatives in all matters affecting the interests of the rubber growing industry.

(The next paragraph refers to Ceylon only.)

If these Associations are willing to undertake this work a reasonable sum should be voted annually in payment of the secretarial and office expense.

(Sgd.) F. Smith,
Secretary

Kuala Lumpur, 12th January, 1915.

The Secretary,
Rubber Growers' Association (Inc.).

Dear Sir,

I thank you for your favour of the 11th ult., which I shall lay before the Standing Committee of this Association at their next meeting.

Believe me, etc.,
(Sgd. H. C. E. Zacharias,
Secretary.

Kuala Lumpur, 25th January, 1915.

Dear Sir,

Mr. Kindersley has handed me your letter of 11th Dec. last covering letter of even date which has already been acknowledged formally by the Secretary of this Association. The proposal regarding a Rubber Growers' Association Committee has now been brought before our Standing Committee and I have informally discussed it with other prominent local men.

The suggestion you put forward is cordially welcomed here as it is generally felt that closer and more regular communication between your Association and ourselves can only be of benefit to the industry.

I suggest however some modifications of the constitution of the proposed committee as we find large committees never meet in this country; and for working purposes it is better to have a fairly small Committee of men fairly centrally situated. I suggest your Committee should consist of the Chairmen of this Association and the Kuala Lumpur Chamber of Commerce, 3 members appointed by this Association and 2 by that Chamber, with Mr. Zacharias (the Secretary of this Association) as Secretary.

A considerable amount of work would, probably devolve upon the latter in this connection as I imagine the Committee might meet rather infrequently but the Secretary would be in correspondence with your Secretary fairly constantly. Mr. Zacharias would be just the person to keep you posted in regard to what goes on here; he is really the only permanent element in this Association and has occupied the position of Secretary ever since there has been a central Planters' Association. He has also devoted much time to the affairs of the Chamber of Commerce of which he is, at present, Chairman. As a question of considerable importance has lately arisen in regard to the new Quit-rent terms I have asked Mr. Zacharias to forward you by this mail a letter of his to Government, and to let you have copies of any further correspondence on that subject. If the local people will not give way upon this point, it is one on which we should no doubt be very glad to be able to invoke your assistance at home.

I may say that I think a sum of $50 a month to Mr. Zacharias should be sufficient to cover all expenses of office, stationery etc., connected with this new Committee.

I am, etc.,
(Sgd.) E. Macfadyen,
Chairman, P. A. M.

E. L. Hamilton Esq.,
Chairman, Rubber Growers' Association.

London, E. C.
31st March, 1915.

Dear Sir,

I am directed by my Chairman, Mr. E. L. Hamilton to acknowledge receipt of your letter dated the 25th January 1915, and to thank you for the information and suggestions which you have been good enough to submit on the subject of the representation of the Rubber Growers' Association, in the Federated Malay States.

Your communication will be submitted to the next meeting of our Council which will be held on the 12th April, after which I will take the pleasure of writing to you again."

I am, etc.,
(Sgd.) F. Smith,
Secretary.

Chairman,

The Planters' Association of Malaya.

The proposal, as put forward by Mr. Macfadyen, is formally approved of.

WEEKLY PAYMENT OF WAGES.

The *Secretary* reads the following letter:—

British Residency, Perak.

8th January, 1915.

Sir,

I have the honour to transmit a copy of a letter from the District Officer, Larut, recommending the institution of a system of weekly payment of wages to coolies and subordinates in these States.

I should be obliged if you could submit the letter for an expression of opinion to the Committee of your Association.

In the event of that body favouring the suggestion I would address the Chief Secretary on the subject, a step which would be undesirable if the Planting Community is opposed to the proposed change.

I have, etc.,

(Sgd.) Oliver Marks,

Acting British Resident, Perak.

The Secretary,

Planters' Association of Malaya.

Taiping, 22nd December, 1914.

Sir,

I have the honour to state that I read in the public prints that the planting and the mining communities are now more than usually anxious to reduce the cost of living in this country.

2. Amongst the remedies which no one—whom I have read—has yet suggested is one which I believe would do away with a great deal of improvidence and that remedy is to pay coolies and subordinates generally, both Government and private, weekly in place of monthly.

3. I believe that once employers got accustomed to a weekly system (such as prevails all over Europe, by the way) they would

be able to pay cash for their purchases and not be obliged as they are now obliged, and, indeed, tempted, to run up bills payable at the end of the month.

4. While I believe that the weekly wage system would benefit the man I think it would inconvenience the master and for that reason I think that the master's reception of the weekly wage idea is likely to be doubtful and hostile.

5. I do not put forward the weekly wage idea as a panacea for everything but I believe that it would tend to check improvidence and reduce prices.

6. The British Resident may think it worth while to send this letter on to the principal planting and mining bodies: unless he knows that the idea has already been mooted.

I have, etc.,
(Sgd.) C. W. Harrison,
District Officer, Larut.

The Secretary to Resident.

Kuala Lumpur, 12th January, 1915.

The Hon. The British Resident of Perak.

Sir,

I have the honour to acknowledge receipt of your letter 8/6995 of the 8th inst. re Weekly Payment of Wages, and am instructed to say in reply that the discussion of this subject will be placed on the agenda of the next meeting of this Association.

I have, etc.,
(Sgd.) H. C. E. Zacharias,
Secretary.

The time being advanced, it is resolved to bring up the matter at the next meeting.

CONTRACTORS.

The *Secretary* reads the following letter:—

Kuala Lumpur, 9th March, 1915.

Sir,

I am directed to inform you that representations have been made to the Government suggesting the desirability of regulating

in some way the numerous class of persons who describe themselves as "contractors" for labour and who operate generally as middlemen between management and labour force.

2. Before deciding that any such steps should be taken the Government would be glad of the views of your Association on the following two points:—

(1) Is your Association satisfied with the existing practice under which a great part of the labour force of the Peninsula is engaged through, and controlled by, so-called contractors?

(2) In the event of your Association not being so satisfied, have they any suggestions to make as regards

(*a*) the restriction of modification of the practice,

(*b*) the termination of this practice, and (*c*) the substitution of some better practice?

I have, etc.,

(Sgd.) J. F. Owen,

Ag. Under Secretary, F. M. S.

The Chairman,

Planters' Association of Malaya.

Agreed to let this matter also stand over until next meeting.

GOVERNMENT SERVANTS AS PATENTEES.

Mr. *Macfadyen* says their friend Mr. Maude and three other gentlemen had applied for a patent for a process for coagulating rubber, and a specification was published in the Government Gazette. Two of the applicants were technical members of the Department of Agriculture. It did, he thought, affect the public generally that it should be possible that Government should permit the chemist and the entomologist of the research department to take out a patent for a process connected with work which they as scientific men were paid to pursue. He did not think it mattered in the least whether the process was a good or a bad one. They naturally inferred from the fact that these gentlemen were supporting it that they believed it to be a good one, and it seemed to him that taking the case of the chemist that was precisely what he was paid to find out, and find out in the public interest and not in his own. He begged to move formally "that the Association protest against members of technical branches of the Government

service being allowed to apply for patents or to hold an interest in patents for processes connected with their own professional work."

Mr. *Cummins* seconds.

Mr. *Maude* says he was very pleased the matter had been brought up, and explains that neither Mr. Pratt nor Barrowcliff had actually discovered the process. They had been shown it when they happened to be at his bungalow, and had interested themselves in it. Mr. Whitby was experimenting with it also. He did not think either Mr. Pratt or Mr. Barrowcliff thought they were doing anything wrong and he certainly took it there was no reason why he should not himself continue with his patent. They had got the very best advice from London in the matter.

Mr. *Macfadyen* hoped nothing in his remarks had suggested he had made any charge against Mr. Maude. Any one of them who dropped on a good thing would patent it at once. His protest was simply against Government permitting their men, as they must be assumed to have permitted them, to participate. He did not suppose for a moment Mr. Maude was capable of doing anything underhand in the matter. (Applause.)

The *Chairman* agrees with the Hon. Mr. Macfadyen's remarks and supports the resolution, which is then passed.

The Meeting terminates at 1.15 p.m.

H. C. E. Zacharias,
Secretary.

Comparative Returns of Imports F. M. S. during the third Quarter 1914.

Articles.	How counted.	Selangor.		Perak.		Negri Sembilan.		Pahang.		Total.	
		Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value
			$		$		$		$		$
Coconuts ...	...	...	291	...	8,345	...	144	...	...	...	8,780
Copra ...	Pikuls	...	...	166	1,660	...	...	...	...	166	1,660
Coffee ...	,,	13	440	93	2,567	23	704	39	1,251	168	4,962
Padi ...	,,	6,511	19,353	17,504	41,247	536	1,614	282	990	24,833	3, 04
Rice ...	,,	357,238	1,824,360	388,092	1,854,480	85,419	419,695	30,515	165,242	861,264	4,263,777
Pepper ...	,,	109	2,641	50¼	1,265	42	982	1	23	202¼	4,911
Sugar ...	,,	15,351	95,575	30,341¼	178,737	3,169	19,482	1,559	10,703	50,420½	304,497
Tapioca ...	,,	835	3,756	1,336	16,024	125	807	½	3	2,296½	20,590
Gambier ...	,,	55½	490	59	941	27½	227	20	321	162	1,979

Comparative Returns of Imports F. M. S. during the Fourth Quarter 1914.

Articles.	How counted.	Selangor.		Perak.		Negri Sembilan.		Pahang.		Total.	
		Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value
			$		$		$		$		$
Coconuts ...	...	...	...	...	46	...	...	...	...	...	46
Copra ...	Pikuls	...	...	226½	1,807	...	...	...	...	226½	1,807
Coffee ...	,,	6	197	99½	2,449	27	815	46	1,430	178½	4,891
Padi ...	,,	6,167½	18,469	9,794	26,465	624	1,872	947	2,907	17,532½	49,713
Rice ...	,,	331,430	1,641,783	312,072	1,685,915	81,827	403,865	38,123	204,863	763,452	3,936,426
Pepper ...	,,	92½	2,141	58½	1,355	25	969	1	24	177	4,489
Sugar ...	,,	16,000	113,596	27,826½	196,947	4,427½	30,445	2,337	19,067	50,591	360,055
Tapioca ...	,,	500	2,036	1,047	14,273	127	941	3	20	1,677	17,270
Gambier ...	,,	56¼	614	93	1,721	32	261	35	422	216¼	3,018

Comparative Returns of Exports F. M. S. during the third Quarter 1914.

Articles.	How counted.	Selangor.		Perak.		Negri Sembilan.		Pahang.		Total.	
		Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value
			$		$		$		$		$
Coconuts ...	...	...	30	...	78	...	556	...	13	...	677
Copra ...	Pikuls	16,316	165,145	43,919	448,289	706	7,067	947	9,570	61,888	630,071
Coffee ...	,,	1,999¾	68,756	116⅖	2,328	...	...	24	357	2,140⅗	71,441
Padi ...	,,	...	...	3,688	8,062	...	...	...	...	3,688	8,062
Rice ...	,,	...	...	57,211	264,534	...	...	...	...	57,211	264,534
Pepper ...	,,	6½	98	...	...	97½	1,758	72	1,240	176	3,096
Sugar ...	,,	...	...	83	569	...	...	...	...	83	569
Tapioca ...	,,	...	...	3,133	3,292	3,326	18,105	3,014	14,316	9,473	35,713
Gambier ...	,,	560	5,007	...	...	2,055	15,097	...	...	2,615	20,104

Comparative Returns of Exports F. M. S. during the Fourth Quarter 1914.

Articles.	How counted.	Selangor.		Perak.		Negri Sembilan.		Pahang.		Total.	
		Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value
			$		$		$		$		
Coconuts ...	...	...	...	...	31	...	339	...	43	...	413
Copra ...	Pikuls	16,209¼	136,723	54,708	411,814	862	6,375	1,439	11,207	73,218¼	566,119
Coffee ...	,,	2,020	67,512	127	2,059	...	...	...	...	2,147	69,571
Padi ...	,,	...	...	7,284	19,284	2	7	...	...	7,286	19,291
Rice ...	,,	...	...	15,983	69,130	...	...	...	...	15,983	69,130
Pepper ...	,,	...	...	...	...	10	122	...	...	10	122
Sugar ...	,,	..	3	13½	139	...	...	...	...	13½	142
Tapioca ...	,,	...	...	2,723	3,169	5,232	30,425	4,011	30,082	11,966	63,676
Gambier ...	,,	699	4,664	...	...	1,502	12,545	...	...	2,201	17,209